

**DETAILED PROJECT REPORT FOR REHABILITATION OF
MANIMUTHAR SUB-BASIN IN PAMBAR BASIN**

PROJECT COST 7266.42 LAKHS

INTRODUCTION:

The State of Tamil Nadu has adopted a multi-disciplinary approach on a pilot demonstration covering about 3000 hectares in the Hanumanadhi Sub-basin of the Tambraparani system. This approach fostered Engineer – Extensionist – Farmer linkages and helped agencies to work together. The ICR Mission for the WRCP has reported that there is a perceptible change in the mind-set of people.

Many of the actions taken by the Government of Tamil Nadu serve as a good foundation to further the reform processes and to move towards a more efficient irrigation service delivery and improved resource management. Agricultural diversification has to be promoted to increase the productivity of water. Paying greater attention to market infrastructure, strengthening research and extension. If farmer's cost and incomes varied according to water used with well irrigation, they would have an incentive to shift some land from water-intensive crops (rice and sugar cane) towards less water-intensive crops (cotton, maize and vegetables). Marketing of produce and better use of information technology in this regard need special attention.

Greater attention is needed for modernizing infrastructure and scaling-up the adoption of water saving technologies. While the use of sprinkler and drip technology have been promoted in the State Irrigation Management is transfer is at an early stage in Tamil Nadu with the enactment of TNFMIS Act 2000. The Water Users Association need considerable training and capacity building to manage irrigation systems under their purview. Although a number of reforms have been initiated and some irrigation infrastructure rehabilitation have been carried out, there is still a substantial need for modernization of infrastructure. The proposed project development objective is to improve irrigation service delivery and productivity of irrigated agriculture with effective integrated water resources management in a Sub-basin frame work.

The Sub-basins are unable to meet their water needs due to scarcity. Due to successive droughts and lack of guidance, cultivation was not done in substantial areas and juliflora has involved these lands. About 18000 hectare of area is covered by juliflora in Melur, Natham, Tirupathur, Sivagangai, Karaikudi, Pudukottai, Devakottai and

Ramanathapuram taluks. These plants consume an average of 3000 m³ of water per hectare per year and total annual loss of water is more than 54Mm³. In most of the tanks community wells have been provided for meeting the domestic needs. After these tanks go dry in summer the ground water depletion is high due to the combined effect of juliflora consumption and domestic extraction.

Cropping pattern:

Success of a crop depends more on the cropping pattern adopted under undependable rainfall. Even during bad years, the gravity of failure of crops can be minimized by selecting most suitable cropping pattern of that season. The crops grown are ground nut, cumbu, ragi, maize, cotton and rice.

Socio-Economy:

Drought has prevailed for three seasons in succession in these minor basins as a result agriculture and animal husbandary suffered a huge set back. Farmers have to keep their lands fallow and these lands have become heavens for juliflora. In the absence of agriculture, fodder for animals have become scarce and water demand for animals could not be adequately met. This has compelled the cattle rearers to sell their cattle to slaughter houses and mere goat and sheep owners have migrated to other areas with their live stock.

In order to improve the efficiency of the conveyance system and thereby bridge the gap, the following action plans are proposed in this project.

- ♣ Rehabilitation of anicuts, supply channels Non –System tanks and Rain fed PWD tanks.
- ♣ Conjugal use of water.
- ♣ Providing micro irrigation
- ♣ Introduction of horticulture crops
- ♣ Introduction of modern techniques in crop cultivation like SRI
- ♣ Providing check dams etc. to increase the ground water recharge.
- ♣ Providing adoptive research trials (ART) and training to the farmers by TNAU.

To prepare this estimate, the ideas and suggestions of line departments and farmers have been taken into account. Many meetings have been conducted to discuss and gather the ideas and needs of the farmers.

Some such meetings are

- * Meetings with the Project Director, MDPU Office, Chennai.
- * Meeting with Line department officials at MDPU Office.
- * Meeting with MDPU Members.
- * Meeting with Line department officials at Karaikudi, Devakottai and Sivagangai.
- * Meeting with MDPU Officials at Sivagangai.
- * Meeting with World Bank Officials and IAMWARM Consultant at Madurai, and their field visits to basin area and discussion with farmers.
- * Meeting with Line department officials and WUA officials at Karaikudi.
- * Walk through surveys with Line department officials, WUA members and farmers at Sub-basin levels.

Based on the needs of the farmers, the Project estimate has been prepared for all the four minor basins of Manimuthar Sub Basin.

Rivers ,Tributaries and Drains: -

There are no perunnial rivers and there are no major reservoirs in this basin. Only the flash flood is occurring in the drainages , surplus courses during the monsoon.

Water Resources Highlight:-

a) Surface water potential:-

Rainfall contributes to the surface and ground water. As the rainfall is erratic, there is an imperative to, store the rainwater in tanks/Uranies by its own Catchment as well as from flood carriers for surface water potential. It is generally assumes that 15% rainfall recorded is available in the form of surface flow in any season.

Using the rainfall data of all the rainfall stations, isohyets were drawn for the three seasons and the average rainfall for all, the three seasons are computed below.

<u>Seasons</u>	<u>Basin's Average rainfall using isohyets for the respective season.</u>
S.W Monsoon	298.10 mm
N E Monsoon	384.37 mm
Transit period	276.37 mm
Annual	973.75mm

From the above values and assuming 15% of this average rainfall to be realized as surface flow, the surface potential is computed as 112.50 M.cum.

(b) Ground Water Potential.

- 1) Induced Recharge of ground water in shallow or deep aquifers for raising ground water table.
- 2) To improve output of ground water from aquifer regions in long durations.
- 3) To improve the quality of ground water.

Area of study in Ramanathapuram and Sivagangai District :-

Ramanathapuram District :-

In this district, Thiruvadanai block is covered by Manimuthar basin and Kottakaraiyar basin drains Thiruvadanai, R.S.Mangalam, Nainarkoil and Ramanathapuram blocks.

Both of these basins in this district is covered by coastal regions and formations of marine origins. In these two basins whether in shallow aquifer or in deep aquifer, the quality of water is highly saline. Since the quality of water is highly saline, no Artificial Recharge Schemes have been proposed to augment ground water recharge.

Sivagangai District :-

In this district, Sakkottai and Kannagudi blocks and small area in North of Kallal and Devalkottai blocks are covered by Pambar basin, Manimuthar basin drains S.Pudur, Singampunari and Thiruppathur blocks and middle portion of Kallal and Devekottai blocks.

Kottakaraiyar basin drains Kalaiyarkoil block, part of Sivagangai block major portion of Ilaiyangudi block, small portions in Devakottai and Manamadurai blocks.

Discussion on Artificial Recharge Schemes :-

While discussing about the construction of Check Dams as Artificial Recharge structure in Sivagangai district with the officials of Water Resource Organisation and Planning and Designing and about the construction of Percolation ponds in Sivagangai District with the officials of Agricultural Engineering Department, it has been informed that the construction of Check Dams across rivers and new Percolation ponds is objected by the public and the members of Farmers Association stating about the possibility of curb for the flow of surface water by rain to the down stream or tail end reach of river irrigated area and supply of water to the catchment area of tanks etc.

Hence it has been decided that to propose Artificial Recharge Schemes by constructing Recharge Shaft to a depth ranging from 10 m to 20 m in the tanks of deeper bed levels for saturating ground water in shallow aquifer regions in sedimentary or hard rock area or recharge injection bore wells to a depth ranging from 48 m to 100 m to saturate deep aquifer zones in hard rock or sedimentary area.

In addition to that the construction of Check Dams across small streams which confluences into the river or the construction of Check Dams across the river which feeds the tank where there is no objection by the public has been proposed for Artificial Recharge Schemes.

As such the followings are the selected locations where Recharge Shafts or Check Dams have been proposed in Manimuthar Basin:

Sl.No	Selected Location	Type of Artificial Recharge Scheme	Estimate Amount in Rs.
1	Sillampatti	Check Dam across Virusuli ar	20,00,000/-
2	Nedumaram	Artificial Recharge Shafts in Nedumaram Tank	5,40,000/-
3	Thiruppathur	Artificial Recharge Shafts in Thiruppathur Big Tank	7,50,000/-
4	Manamelpatti	Check Dam across Virusuli Ar	5,00,000/-
5	Karuvelkuruchi	Check Dam across Manimuthar River	32,50,000/-
6	Aralikkottai	Artificial Recharge Shafts in Aralikkottai Tank	7,25,000/-
7	Kallippattu	Check Dam across Mattiyar Stream	6,25,000/-
8	Udaiyachi	Check Dam across Kooriyar	4,50,000/-
	Total		88,40,000/-

Water Demand:-

1. For Agriculture = 301.77 M.Cum
2. For Domestic needs = 10.50 M.Cum
3. Live stock demand = 18.00 M.Cum.
4. Industrial Demand = 8.24 M.Cum

Total Demand = 338.51 M.Cum

Water Balance

It is seen that the water balance for agriculture purpose is found to be deficit from the detailed computation done in the articles 2.5.6 and 2.5.7

	Pre Project	Post Project
Surface Run off	112.50 M.Cu.m	180.00 M.Cu.m
Ground Water	35.20 M.Cu.m	52.80 M.Cu.m
TOTAL POTENTIAL	147.70 M.Cu.m	232.80 M.Cu.m
<u>DEMAND</u>		
Agriculture Demand (based on Cropwater Requirement Working Sheet)	301.77 M.Cu.m	229.87 M.Cu.m
Domestic Demand	10.50 M.Cu.m	10.50 M.Cu.m
Live Stock Demand	18.00 M.Cu.m	18.00 M.Cu.m
Industries Demand	8.24 M.Cu.m	8.24 M.Cu.m
TOTAL	338.51 M.Cu.m	266.61 M.Cu.m
Net Deficit	190.81 M.Cu.m	33.81 M.Cu.m

Ground water Quality:-

In most of the upper half of this basin, the ground water quality is good and in lower reaches it is of moderate quality.

The test results of quality of surface water and ground water are narrated in the project proposal submitted by Environmental Division, Madurai.

Land use pattern and Land holdings: -

Land area is used in several ways. Agricultural

Department has classified the land into nine categories depending upon the way in which the land is used (or) put to use and these details are tabulated as follows

SI. NO.	Land Use Category	Area in Hect.	% to the Basin Area
1	Forest	28713	10.04
2	Barren and uncultivable land	6404	2.24
3	Land put non- Agriculture use	43310	15.14
4	Cultivable waste	13021	4.55
5	Permanent pasture and grazing land	1446	0.51
6	Land under miscellaneous trees groves not included in sown area	6449	2.25
7	Current fallows	39503	13.95
8	Other fallow lands	54466	19.04
9	Net Area sown	92331	32.28

Soil Classification:-

Three types of major soil classifications are,

- i) Geological classification
- ii) Classification by soil scientists based on soil composition
- iii) Classification by agricultural department based on the soil profile

Command Area details :-

Sl. No	Particulars	Ayacut in Hect		
		Non system Tanks	Rainfed	Total
1	Manimuthar Minor Basin	7075.25	1084.31	8159.56
2	Virusuliyar Minor Basin	2529.76	1278.39	3808.15
3	Thrumanimuthar Minor Basin	1832.14	183.91	2016.05
4	Palar Minor Basin	2937.43	0.00	2937.43
	Total	14374.58	2546.61	16921.19

Agriculture:-**Type of land:-**

Under this, the details of wet and dry lands are to be dealt with. Wet lands are under the command of the systems and non system tanks .No direct Ayacut is practiced in this sub basin. The deficiency of water demand in system and non system tanks is supplemented through wells in certain command area . In lands where tank irrigation is not possible ,dry crops are raised.

Agriculture practice:-

Most of the agricultural operations are carried out manually except land preparation and puddle which are done by using bullocks (or) Machineries .For peak period (transplanting ,weeding , harvesting)farmers make use of hired labour mostly engaged from neighbour family within the village .The agricultural inputs comm only used are fertilizers , pesticides and fungicides.

Cropping pattern and crop calendar: -

These details have been collected from agriculture from Agriculture department for this sub basin and are produced.

Crop	Without Project				With Project				Increase
	FI	PI	Gap	TOTAL	FI	PI	Gap	Total	
Fruit Plan	0	120	0	120	285	0	0	285	165
Banana	0	0	0	0	0	0	0	0	0
Coconut	250	0	0	250	300	0	0	300	50
Sugarcane	425	0	0	425	530	0	0	530	105
Fodder	0	100	0	100	200	0	0	200	100
Total	675	220	0	895	1315	0	0	1315	420
1st season									
Paddy	5127	6453	0	11580	11580	0	0	11580	0
Maize	0	0	0	0	838	0	0	838	838
Vegetable	0	1178	0	1178	1498	0	0	1498	320
P.Juliflora	0	0	1690	1690	0	0	1690	1690	0
Total	5127	7631	1690	14448	13916	0	1690	15606	1158
Fallow	0	0	1578	1578	0	0	0	0	0
Total	5802	7851	3268	16921	15231	0	1690	16921	1158
2 nd season									
Gingelly	0	175	0	175	0	275	0	275	100
G.nut	0	800	0	800	0	1400	0	1400	600
Pulses	0	475	0	475	150	650	0	800	325
Vegetable	0	0	0	0	125	0	0	125	125
Total	0	1450	0	1450	275	2325	0	2600	1150
Grand Total	5802	9301	3268	18371	15506	2325	1690	19521	2758
Cropping Intensity				89%				115%	

Use of fertilizer and pesticides :-

The usage of fertilizer and pesticides has increased by leaps and bounds over the years due to overwhelming increase in the crop yield and thus on the return in this initial period. But its extension use has resulted in progressive deterioration of soil and water quality coupled with progressive reduction of soil fertility and productivity, Hence the extent of their usage is taken into consideration to protect the quality of basin water, soils and the environment.

Crop Water Requirement and water demand for Agriculture :-

The net crop water requirement (CWR) for various crops are computed by latest technology, The field over all efficiency 44% is adopted for tank irrigation and 75% for well irrigation depending on the crops.

The crops water requirement (CWR) for all crops cultivated in this sub basin is calculated for pre project

CWR Ayacut area (18371 Ha including 2nd crop) :- 301.77 M.Cum

Industries:-

Sl.No	Name of Taluk	Name and Location of Industry	Status
1	2	3	4
1	Karaikudi	Malar Solvents and Extract(p) Ltd., S.No. 217/48, Aranthangi Road Karunavalkudi, Sakkottai Post.	-
2		Milk Chilling Centrs. S.No. 240/2, Kalani Vasal Village, Karaikudi	SSI
3		Corn Industries & General Enterprises Ltd., S.No. 360 361, Kundradudi Rd, Kandukattan Village	-
4		P.S.P Palaniandavar Rice & oil. Pallathur	SSI
5		K. Senthil Kumaravel Nadar Rice Mill 10. Samundi pottal street, Puduvayal	SSI
6		Pandia Ranjan Rice Mill. S.No. 1102-23 Murugappa Chettiar Oorani. North Pudhu vayal	SSI
7		Veerayee Ammal Rice Mill. 13-5-1 Kanvar street, Pudhu vayal	SSI
8		Ganesa Rice & Flour Mills, 10-4-1 Main Road, Pallathur	SSI
9		Sri Iarivizhi Ammal Modern Rice Mill 12-212, Aranthanki Road. Pudh vayal	SSI
10		A.G.R. Rice Mill . S.No. 217/5 Veerasekara Puram Pudhu vayal	SSI
11		V.M.Modern Rice Mill. 135/1A Irattaipillyar North street. Karaikudi	SSI

Sl.No	Name of Taluk	Name and Location of Industry	Status
12		Selva Modern Rice Mill. Kandanoor. Pudukkottai	SSI
13		Mohan varukadalai Mill. 10/2 Pudu Market East St. Karaikudi	SSI
14		Johnsi foods(p) Ltd., S.No. 29/262 Siruvayal Rd., Subramaniyapuram post. Kalanivasal	SSI
15		Periyar Cashewnut Processing Workers Indus, Co-op society Ltd., S.No. 198/2 Kasali. Kundrakudi	DO
16		Sri Nachammai Cotton Mills Ltd., S.No. 43/6 Chettinad	-
17		Snekavalli Textiles (P) Ltd., S.No. 66. Sankara puram. Devakottai Rastha, Karaikudi	-
18		Kadirvel Textiles (P) Ltd., S.No. 419/2 Thiruppathur Road, Nachiapuram	-
19		Lakshmisankar Mills (P) Ltd., S.No. 240 Arannanai, Siruvayal, Kallal	-
20		Minar Textiles Indus Ltd., S.No. 354/4,5,6 Managiri, Karaikudi	SSI
21		Sri Kaderiammal Mills (P) Ltd., B.Unit S.No. 45/2 Shanmuganathapuram, Karaikudi	-
22		Sri Vigneswara Cotton Mills. S.No. 1701/4, Chettinad	-
23		Minar textiles Indus Ltd., D.No.2/3A, Kovilur , Karaikudi	SSI
24		Sri Nachammai Cotton Mills Ltd. B. Unit S.No. 43/6 Chettinad	-
25		M/S Malar Textiles (P) Ltd. S.N0.6/2B Madurai, Main Road, Managiri, Karakudi	SSI
26		Sri Nachammai Cotton Mills Ltd., 2/5.93A Mukulathoor Street,Athankundi	-
27		Ambal Reeling Mills, 1/3D Thiru Nellai Annan Sannath i St., Koovilur	SSI
28		Heritage Paper Mills Ltd., S.No 95 VEDIYANKUDI (V) Mithrvayal	-
29		Lakshmi Textiles Paper Tubes. 9.1 Industrial Estate Devakottai Rasta, Karai kudi	-
30		Sri Sakthi Cones, S.No.142/3 Kalanivasal Village, Annan Koil North St., Kovilur, Mangiri	-
31		The South India Press D.No. 48, M.N.St., Karaikudi	-
32		M.M.470. The RamnadDt.,Co-op Printing Works ,1-5& 6 Industrial eastate. Karaikudi	-
33		Siva Soap Company, S.F. 150/3,1504 Siva Gardes Kothari Village Pallathur	SSI
34		Mariammai Match Works. D.No. 37/37 Puthu Market. East St, Ganesa Puram Karaikudi	-
35		T.C.P. Ltd., S.No. 125/4 Kalanivasal Village Managiri	-

Sl.No	Name of Taluk	Name and Location of Industry	Status
36		Sechem s.No. 264/2 Perattukottai Village Amaravathi Pudur	-
37		Nehruji Polythene Workers Indus. Co-op Soc. Ltd., 10 West Car Street, Kundrakudi	SSI
38		Nehruji Polythene Workers Indus Co-op Soc. Ltd., S.No. 2/194 Kundrakudi	SSI
39		Saravana Decorative Lamination Ltd., S.No.184 Karaikudi Main Road, Kundrakudi	-
40		Electro Protection Services Pvt Ltd., 58A Kottayur Main Rd., Sekkalai, Karaikudi	SSI
41		Scientific Metal Engrs. Pvt. Ltd., 130 CMC Road., Karaikudi	SSI
42		Gani Iron Works. S.No. 3. Keelayurani Neelakkarai Karaikudi	SSI
43		N.M.H. Steel Industry, Devakottai	SSI
44		Arignar Anna Lead Acid Battery workers Indus Co-op soc. Ltd, S.No.158 Saravanapoigai, Kundrakudi	-
45		Mecman Crafts Industries (P) Ltd. 34/1 New Street, Meenakshi Puram, Karaikudi	-
46		Balaji Engg. Works. 483 VOC Rd., Karaikudi	-
47		Tamilnadu State Transport Corpn. Ltd., Div III , D.No. 144, Marudhapandinagar	-
48		TNSTC Bodybuilding Unit 325, Sekkalai Rd., Karaikudi	-
49		Sri Karpagamoorthy Agency,1, Greeas Rd., Karaikudi	SSI
50		Sri Karapagamoorthy Automobiles , S.No.66/1A, Tirunellai Amman Plot No.15-18, Kovilur	SSI
51		Central Electro Chemical Research Institute. 512/2Alagappan Nagar , Karaikudi.	
52		Kathirvel Rice Mill, S.No.6/3,4,5,6 Yellambar Street, Pudevayal.	
53		Sri Karpagamoorthy Auto Mobiles, S.No.66/1A, Thirunilai , Kovilur.	
54	Devakottai	Sri Kaderiambal Mills Ltd., S.No. 42/1B Sanmuga Nadhapuram	-
55		Alagammai Cotton Mills P Ltd., S.No. 164/3, Kayavayal Village, Sanmuganathapuram Po, Devakottai T.K	-
56		Tamilnadu State Transport Corporation Ltd. Tiruppathur Rd., Ranmagar., Devakottai	-
57		Tamilnad State Tran.Corp.Ltd., Div III Reconditioning Unit., 333, Tirupathur Rd., Devakottai	-
58		J.V. Steel Rolling Mill Pvt. Ltd, S.No.91,92. Industrial Estate, Devakottai Rasta.	-
59		Balu Chettiyar Rice Mills, 1-A, Sankarar Koil Street, Devakottai.	-

Sl.No	Name of Taluk	Name and Location of Industry	Status
60	Thiruppathur	Sri Denalakshmi Rice & Oil Mills, S.No 4-2-12, Pallangudi Rd., Singampunari	SSI
61		Manimaran Oil Mills . S.No. 148/1A Dindigul Road. Singampunari	SSI
62		Vasantha Textiles S.No. 118/2 Dindigul Road, Karaiur	SSI
63		Pillayarpati Textile and exports Ltd., S.No. 158/2 Udayanathapuram, Kandavarayanpatti Rd., Tiruppathur	-
64		L.J Textiles Ltd., S.No. 7/4 Dindigul Rd., Sing ampunari	-
65		Sri.Veerajothi Textiles P Ltd., S.No. 626/1A Tekkur, Tiruppathur	-
66		K.Periyasamy & Co Angayarkanni Fibre 666/7 Selvavinayagam Koil Street, Singampunari.	SSI
67		Tamilnadu Fibre Industries S.No.426/6 Annaikaraipatti, Singampunari	-
68		Bright Fibre Industries S.No. 186/1 Kodukanpatti, Singampunari	-
69		Sivaraman COIRS.S.F.715/10-A Thiruppathur Road, Savaripatti Villakku, Singampunari	-
70		Sri Alagumurugan Saw Mill S.No. 28/1 Tiruppathur Rd., Kundrangudi	-
71		Kamatchi Chamber Bricks. S.No. 258 & 263 Thenkarai Sirukootalpatti	-
72		Arun Steels. S.No. 514/1/4 M.Adurai Rd., Singampunari	-
73		Tamilnadu Gears & Shafts Corpn. S.No. 3/3C Anaikaraipatti, Singampunari	SSI
74		Smartins S.No. 4/2 Anaikaraipatti. Singampunari	SSI
75		Sheet Metal Processing & Engg. Enterprises. S.No. 7/7 Anaikaraipatti, Singampunari	-
76		Lalitha Industries S.No. 4/5 Anaikaraipatti Singampunari	-
77		M.M.Forging S.No. 4-1-42 Anaikaraipatti Singampunari	-
78		Vinson Engg. Company 2-1-36C Canal Rd., Singampunari	SSI
79		Devika Textiles Private Limited, D.No.2 / 58, West Street, Palavankudi, O.Siruvayal.	
80	Melur	Sri sindarai amman granite cutting and polishing units division –I Rs.No;307/2,308/6,Keelaiyur,Melur Taluk	DO
81		Aruna coir industries S.No 104/1,Pallapatti Post ,Kottampatti, Melur Taluk	SSI
82		Card Coir and coirProducts S.No. 43/4 Suthenthirapuram,Pallapatti, Melur Taluk.	SSI

Sl.No	Name of Taluk	Name and Location of Industry	Status
83		Kavitha Coir Industries F133/10,Thonthlingapuram Velacheripatti,Kottampatti,Melur Taluk. Road	SSI
84	Natham	P.P.Rice Mill, S.No, 286/1, Yuralipatti, Ambalapuram, Natham	Non-SSI
85		Neo Index Mills Ltd, Unit-I, S.No 217/3 A, 3B PullampattiKattuvellampatti, Natham TK	Non-SSI
86		Madurai Meenakshi Textiles(P) Ltd, S.F.No 463/2 & 3, 465/3B, Ullapakudi Dindigul Road, Natham TK	Non-SSI
87		Neo Index Mills Ltd, Unit-II, Kattuvellampatti, Natham TK	Non-SSI
88		Nikathana Textiles (P) Ltd, R.S.No 535/2 , Senthurai Road, Nadumandalam Village, Natham TK	Non-SSI
89		Star Fibre And Allied Industries, S.No 394/2, Vathiipatti Post,Natham TK	SSI
90		Tamilnadu State Transport Corporation Limited, (Madurai Division-IV) S.No. 206/5, Vellampatti, Dindigul - Natham Road, Natham Taluk	Non- SSI
91		Sri chakra Blue metals, Natham .	O/S
92		Shakkara soap industries , Sendurai road, Natham .	R/S
93		Ramco Blue metals, Sirukudi , Natham.	O/S
94		Air mineral enter prises, Sirukudi, Natham .	O/S
95		S.K.moideen Saw mill, Natham .	O/S
96		TNSTC Natham depot, Natham.	O/S
97		Servo Seva Gromothoya Samthi Milk chilling center, Santhipuram , Natham .	O/S
98		Madurai Meenakshi Textiles, Uluppakudi post, Natham	O/S
99	Karaikudy	M/S Nagappan Spinning Mill Kottaiyur,KaraikudyTK, Sivagangai Dist.	OS
100		M/S Veepee Textiles Thappu Thottam, Ariyakudy, Karaikudy TK,Sivagangai Dist.	OS
101		M/S Vincent (Karikudy) Bottlers Pvt. Ltd, 482,Voc Road, Karaikudi Sivagangai Dist.	OS
102		M/S Kali Aerated Water works, 322,Sekkalai Road, Karaikudi, Sivagangai Dist.	OS
103		M/S Hotel Sugam International, 17,Kovilur Road, Karaikudi – 1, Sivagangai Dist.	OS
104		M/S U.S. Modern Rice Mill, Kundrakudi Road, Partharakudy, Karaikudi TK, Sivagangai Dist.	OS

Sl.No	Name of Taluk	Name and Location of Industry	Status
105		M/S Sri Mangudi Sathiah Modern Rice Mill, Pudukkottai, Karaikudi TK, Sivagangai Dist.	OS
106		M/S Bawa Maasha Modern Rice Mill, Versekarapuram village, Sakkottai, Pudukkottai-630 108, Karaikudi TK, Sivagangai Dist.	OS
107		M/S Annalakshmi rice Mill, Pudukkottai village, Karaikudi TK, Sivagangai Dist.	OS
108		M/S Tnstc Ltd, (Karaikudi Br) Koviloor, Karaikudi Tk, Sivagangai Dist.	OS
109		M/S Karpaga Vianayagar Blue Metals, V.Sooraikudi, Karaikudi TK, Sivagangai Dist.	OS
110		M/S Sree Balaji Textiles, Thopputhottam, Ariyakudy, Karaikudi TK, Sivagangai Dist.	OS
111		M/S White Lotus Agro Foods (P) Ltd, O.Siruvayal Karaikudi TK, Sivagangai Dist.	OS
112		Naachamain Cotton Mills Ltd,(Realing Unit) Alangudi, Karaikudi TK, Sivagangai Dist.	OS
113	Thiruppathur	M/S Amali Therasal Textiles, Kundrakudi, Thiruppathur TK, Sivagangai Dist.	OS
114		M/S Sri Jaya Fibers, Selvavinayagar Koil Street, Singampunari, Thiruppathur TK, Sivagangai Dist.	OS
115		M/S Anitha fibers Kannamangala Pathi village, Singampunari South, Thiruppathur TK, Sivagangai Dist.	OS
116		M/S KRA Modern Rice Mill, Singampunri, Thiruppathur TK, Sivagangai Dist.	OS
117		M/S TNSTC Limited, Thiruppathur Br, Thiruppathur, Sivagangai Dist.	OS
118		M/S Shanthi stone Crusher, Aralikottai, Thiruppathur TK, Sivagangai Dist.	OS
119		M/S Periyanyaki Stone Crusher, N. Valavan patti - Siruvayal, Thiruppathur TK, Sivagangai Dist.	OS
119		M/S Gayathri Stone Crusher, N.Vairavanpattinam, Thiruppathur TK, Sivagangai Dist.	OS
120		M/S Shenbagam Metal Industries, Mankobu, Thiruppathur TK, Sivagangai Dist.	OS
121		M/S S.T. Michel Ammal Metals, Aripuram, Chirukoodi Patty, Thiruppathur TK, Sivagangai Dist.	OS
122		M/S Selvaraj Blue Metal Nagappan Pattinam, Erayur Post, Thiruppathur TK, Sivagangai Dist.	OS

Sl.No	Name of Taluk	Name and Location of Industry	Status
123		M/S Sri Angalamman Crusher, V.MalamPatty Village, S.Venlangudi Post, Thiruppathur TK, Sivagangai Dist.	OS
124		M/S Sri Peryakaruppasamy five Star Blue Metal, V.Malampatti vilakku, S.Velangudi P.O. , Thiruppathur TK, Sivagangai Dist.	OS
125		M/S Thiyalnayagi Blue Metals, Minnalkudi, Murvikondan Patti Post, Thiruppathur TK, Sivagangai Dist.	OS
126		M/S Sri Devi Blue Metals, Jeyankondannilai, Thiruppathur TK, Sivagangai Dist.	OS
127		M/S Malai Matha stone Crusher, Tuvar, Thiruppathur TK, Sivagangai Dist.	OS
128		M/S S.M.A. Blue Metal Industries, Thoovar, Thiruppathur TK, Sivagangai Dist.	OS
129		M/S A.V. Valliammal Metals Unit-II , Seyyur Village, Thiruppathur TK, Sivagangai Dist.	OS
130		M/S Vairam Surgical Cotton Industrial Private Limited, Pillaiyarpatti Village, Thiruppathur TK, Sivagangai Dist.	OS
131		M/S Saravana Decorative Lamination Ltd, Karaikudi Main Road, Kundrakudi, Thiruppathur TK, Sivagangai Dist.	OS
132		M/S Sri Selvavinayagar Mill, Kattaakudi Patti Village, Ulagam patti (Via), Thiruppathur TK, Sivagangai Dist.	OS
133	Devakottai	M/S TNSTC Limited,(Devakottai Branch) Devakottai TK, Sivagangai Dist.	OS
134		M/S TNSTC Ltd (Devakottai Br) 333,R.C.Unit, Thiruppathur Road, Ramnagar, Devakottai TK, Sivagangai Dist.	OS
135		M/S TNSTC Ltd (T.R.Plant), 333,Thiruppathur Road, Devakottai, Devakottai Tk, Sivagangai Dist.	OS
136		M/S Bose Chamber works, Kavathukudi Village, Devakottai Tk, Sivagangai Dist.	OS
137	Melur	Engineer VMK &Co S.No7/3,KottampattiVillages Melur Taluk	RS

Present Scenario:-

Constraints in the irrigation system: -

Manimuthar sub basin is a rapid, wide and old system. The major constraints in irrigation are highlighted below.

- The non availability of new anicuts, grade walls bed dams, diversion structures etc essential at the existing open off takes of the in minor rivers leads to poor rain water harvesting during monsoon.
- The damaged (or) dilapidated condition of the existing anicuts, diversion head works etc. and supply channels causes to poor standard of the entire conveyor system. No desilting work and improvement works have been carried out for the past many years. Due to long run of time, heavy accumulation of silt has been occurred in the channel bed by the earth sliding from the banks and due to flow from the minor river. The heavy growth of jungle in the bed is obstructing the flow in the channel severely; As such the supply channels have lost totally their original carrying capacity and designed cross section.
- For many decade, most of the rain fed tanks and non system tanks were not taken up for desilting and full standardization due to lack of funds. They are now silted up heavily causing reduction of original capacity of the tanks. In addition, due to the poor standard of tank bund, water could not be stored upto FTL which results to further reduction in the original capacity. The loss in capacity affects the cultivation.
- The allied structures of tank such as sluices and weirs are in bad a damaged condition which leads to heavy leakages resulting difficulties in control of water delivery to the command area. The sluices are in dilapidated condition sometimes affects the tank bund also due to heavy leakages in barrel of the sluice. The water loss due to uncontrolled delivery from the damaged sluices and weirs play the major roll in cultivation statistics.
- There are only earthen filed channels in existence for distribution of water to the command area from the tank sluice. The flow in earthen channel leads to considerable loss of water, non-possibility of equal distribution to tail end lands and thus conflict arises among the farmers.
- At Present, the farmers follow the traditional old practice in cultivation. There is lack of awareness among the farmers for effective utilization of water to the requirement of crop. Proper selection of cropping pattern is not adopted for devising the optimal benefit per unit of water.

- More over there was a flash flood during last year November 2005 in this basin area causing heavy damages almost in all tanks and flood banks, Aprons in Anicuts and also in conveyance system of this sub basin area.

Objectives of the Project

The Principal objectives of the IAMWARM Project are

- ❖ To ensure preservation and stabilization of the existing water resources by rehabilitation and standardisation of the existing irrigation infra structures and construction of new structures wherever required with the aid of Plan formulation wing of WRO.
- ❖ Restoration of surface water and ground water potentials and improving them wherever possible through effective rainwater harvesting processes with the help of Ground water wing of WRO.
- ❖ Planning to, save water in the command area through involvement of farmers in water management mechanism and training facilities in connection with this.
- ❖ Collection of data on land use and present practice of irrigation, so that modern methods of irrigation practices are to be explored for increasing the productivity of crops per unit of water for irrigation.
- ❖ Adopting a proper selection of cropping pattern which may give optimum benefit for the success of the project.

Remedies and Action Plan by WRO :-

Inorder to overcome the bottlenecks encountered in the efficiency of the present irrigation system, action has been taken by WRO as follows based on the concept of the IAMWARM Project.

- * Effective rainwater harvesting from the catchments for restoration of surface water and ground water resources.
- * Improving the overall irrigation efficiency by rehabilitation of infrastructures of conveyer system (Channels) and storage system (Tanks) may be preferred to the required extent as being implemented in the modern irrigation Projects.
- * Economic and effective utilization of water in the command area is to be achieved by implementing water management practices among the farmers, through formation of Water Users Associations.
- * The WUAs are already formed in Manimuthar and Virsuliya Minor Basins only. And WUAs identified in Palar, Thirumanimuthar minor basin and rain fed tanks proposed in this project area have been taken in to Account for forming new water users association.
- Conjunctive use of surface and ground water in all sources by giving awareness among farmers

- To stabilize the existing registered ayacut in cultivation by bridging the gap by reducing the water demand in the way of effective water management and adoption of modern agriculture techniques (Micro irrigation) with the involvement of both the WRO and the line departments.
- The flood affected structures and components have been identified and necessary permanent remedial measures are proposed in this project.
- To adopt the suitable cropping pattern which requires less water demand and more benefit to the farmers in consultation with the agriculture Department and the research team of TamilNadu Agricultural University

Roll of Line Departments -

The Line department's official along with WRO officials have to hold a joint stakeholders meeting after under taking a detailed walk through survey of all the irrigation systems to assess their demand. Farmer's acceptance for adopting the modern methods of irrigation like SRI, Drip, Sprinkler, Organic farming and diversification of crops may be assessed.

Project Proposals:-

The following data relevant to the project proposals have been collected and produced in this proposals

- ◆ Salient features of the existing irrigation systems viz. Head works, anicuts, supply channels and Tanks co-related to memories and its present conditions.
- ◆ Flow diagrams of the rivers, canals and system & Non system tanks.
- ◆ Water resources data from IWS, Taramani
- ◆ The land holding of the farmers with details of crop cultivated, method of cultivation for the past 10 years and number of wells, present land use etc.
- ◆ Relevant maps regarding the sub basin.
- ◆ No.of WUAs to be formed in the Non -WRCP area.
- ◆ New schemes in the sub basin already prepared by the Plan formulation wing of WRO.

Walk through survey

A Walk through survey has been conducted by WRO officials along with WUA Members and Line department officials to assess the actual need of the farmers and also to take participate themselves actively in the process of planning and formulating the project proposal for this sub-basin The Minutes of the walkthrough survey with the stakeholders are enclosed herewith

Estimation of Project Cost: -

WRO

Based on the model estimate for every infrastructures, the project cost proposed by the WRO is estimated to a tune of Rs. 6209.25 Lahks. for rehabilitation of irrigation system covered to the extent of 16921 Ha. .

Implementation Schedule :-

The spanning period of the project implementation will be scheduled within the project period of three years based on the project management techniques after the finalization of the DPR.

Socio – Economic Study.

Population of Villages in this sub – basin is about inhabitants most of them being agriculturalists and labourer. There are sufficient labourers available throughout the year.

The average figure of number of families per village benefiting from this project is nearly 250 to 500, The relevant farm size and their holding farmers are as below.

Less than 1 Ha	Small	77%
Between 1 to 2 Ha.	Marginal	13%
Above 2 Ha.	Big	10%

From the above, it is confirmed that almost all beneficiaries are marginal and small farmers.

Because of the present condition of the irrigation structures, erratic & unpredictable monsoon and high risk involved in crop cultivation, the gap between the water demand and available total water potential is alarmingly large as revealed in the hydrology calculations. This has resulted in around frustration and sufferings due to poverty among the farmer community.

As a result of the project, the overall efficiency of tank irrigation system will be improved by utilizing the water economically for increasing then productivity and also developing the living standards of farming community throughout the year.

Economic Analysis

The project focuses on improving the water resources management for increased irrigation coverage to attain the registered Ayacut and efficiency, dependable water supplies to high yielding variety crops and inputs to the other agricultural components of horticulture and livestock.

Benefits from the Project: -

After the implementation of the project .

- 1) The loss of precious rainwater will be minimised to a greater extent by rehabilitation of conveyer and storage systems, The delinked chain of tanks will be relinked.
- 2) The additional flow into the tanks can be utilized for filling the water ponds in the village which will solve the drinking water problems to live stocks.
- 3) Due to storage of water in tank to its full capacity, the ground water potential of the entire sub - basin will be increased considerably and the sea water intrusion problem will be minimized in the coastal region.

- 4) Reconstruction (or) Repairs to infrastructures of the tank will help greatly in reducing the wastage due to leakage of precious collected rain water.
- 5) Formation of Water User Association at all levels will help in the better basin water management and turning over the system under the maintenance of the user groups after post implementation of the project and in solving the conflicts arising during water scarcity period.
- 6) The scheme is expected to bridge the gap in the registered ayacut by adopting the modern technology in agriculture and change in cropping pattern in order to increase the productivity and profit in agriculture.
- 7) After completion of the project the impact on agriculture through intensification and diversification in farming activity in the scheme will generate additional employment opportunities. Implementation of the project involving civil works will further add employment opportunities to the local labourers during project execution.
- 8) Above all the social economic status of the basin people will be improved greatly.

ANICUTS:

It is proposed to rehabilitate all the anicuts constructed across Rivers. This includes removal of shoals on the upstream and downstream sides, renewal of shutters and repairs to the aprons. The flood banks will be strengthened as per standards.

TANK BUNDS:

Desilting of the tanks, increasing their capacity have been proposed. The excavated earth will be laid on the bund to strengthen the same. Model sections will be constructed at an interval of every 500m of bund with a top width of 3 for standardization. Necessary revetment has also been proposed at vulnerable portions of bund over gravel backing. Steps have also been proposed for easy access to farmers.

TANK SLUICES:

Sluices in dilapidated condition are proposed to be reconstructed with cement concrete 1:3:6 instead of R.R. Masonry and the sluices will be made good in all respects. Screw gearing plug arrangements have been proposed to in all sluices to regulate the tank water according to the needs of the farmers.

WEIRS:

The surplus arrangements provided in the tanks are proposed to be rehabilitated.

SUPPLY CHANNELS:

The main supply channels from the anicut to the tanks and branch supply channels are proposed to be reshaped for the efficient discharge of water into the tanks.

Manimuthar Sub Basin comprises of the following Minor Basins

1. Thirumanimuthar
2. Palar
3. Virusuliyar
4. Manimuthar

VIRUSULIYAR RIVER:

Virusuliyar minor basin now in existence covers both Pudukkottai and Sivagangai Districts. The river originates from the surplus of Murukka kanmoi in Thirupathur taluk of Sivagangai District traverses to a distance of 35 km in South west direction in Thirumayam, Thiruppathur and Karaikudi taluk and finally join in Manimuthar river, just upstream of Poyyalur anicut across Manimuthar river.

There are 11 anicuts across the river. The total ayacut of this system comes to 3808.15 Hectare (inclusive of proposed rain fed tanks to be taken up in this project)

- ◆ Soori anicut
- ◆ Melasivapuri anicut
- ◆ Kotti anicut
- ◆ Pappanpatti anicut
- ◆ Keelakanmoi anicut
- ◆ Mahibalanpatti anicut
- ◆ Chinnakavini anicut
- ◆ Kandavarayanpatti anicut
- ◆ Parani anicut
- ◆ Kilamadam anicut
- ◆ Naduvikkottai anicut

The project estimate for this Sub-basin has been prepared with the objective of correcting the present deficiencies of the above system and simultaneously improving the over all efficiency of the present system. The following components have been contemplated in this IAMWARM Project estimate.

1. Rehabilitation of anicuts
2. Reshaping of supply channels.
3. Rehabilitatin of PWD non-system tanks and PWD rain fed tanks
4. Improvements to sluices, weirs
5. Construction of cross drainage works.

In addition to the above, the following proposals have been contemplated in this Sub - basin.

- ✱ Construction of bed dams in the open off take.
- ✱ Construction of Groynes in some of the open off take.
- ✱ Construction of an anicut across the surplus course.

MANIMUTHAR:

The surplus of Eriyur tank is the origin of Manimuthar river and traverses to a distance of 65k m in Thiruppathur, Karaikudi, Devakottai and ThiruvadanaI taluks of Sivagangai and Ramanathapuram Districts and confluences with Pambar near Sirukambaiyur village of Ramanathapuram District and finally join with Bay of Bengal near S.P Pattinam village. The following 22 anicuts and open off takes irrigating 8159.56 Hectares (inclusive of proposed rain fed tanks to be taken up in this project).

- Vadamavali anicut
- Anjukal anicut
- Pannai anicut
- Sembanur open off-take
- Marudhan open off-take
- Kannappu open off-take
- Poyyalur anicut
- Veppankulam open off-take
- Visalayankottai open off-take
- Melakavanavayal open off-take
- Kallangudi Anicut
- Eluvankottai anicut
- Thirumanavayal open off-take
- Thalakkavayal open off-take
- Kaikudi open off-take
- Thuduppur open off-take
- Hanumanthakudi Open off take
- Hanumanthakudi anicut
- Visumbur open off-take
- Neerkundram open off-take
- Kallavizhiendal open off-take
- Sirukambiyur anicut.

Sunnampiruppu Surplus course

1. Uthamasalai Anicut
2. Perichikovil Anicut
3. Pannithiruthi Anicut

Thiruppakottai surplus Course

1. Kunjangulam Anicut
2. Akkalur – Nagarikathan Anicut

4. Rehabilitation of Anicuts
5. Reshaping of supply channels.
6. Improvements to sluices, weirs
7. Improvements to sluices, weirs
8. Construction of cross drainage works.

In addition to the above, the following proposals have been contemplated in this Sub-basin.

- * Construction of bed dams in the open off take.
- * Construction of Groynes in some of the open off take.
- * Construction of an anicut across the surplus course.

THIRUMANIMUTHAR MINOR BASIN

Thirumanimuthar river originates in MULAIYUR Hills in Natham taluk of Dindigul District. The river bifurcates into two arms after it traverses a length of 40km in its course. After bifurcating the length of left arm is 10km and right arm is 35km. The left arm is called "Uppar river" and it confluences with Palar river in Singampunari village. The right arm is called "Uppodai" and it empties Eriyur big tank in Eriyur village. The basin covers the following taluks.

- i. Natham
- ii. Melur
- iii. Thiruppathur.

There are 10 Nos. of anicut across this river as detailed below: -

Thirumanimuthar before bifurication:

- 1) Kotta periyakulam anicut
- 2) Peekulam anicut
- 3) Sennapallam anicut
- 4) Anjanakarankulam anicut
- 5) Rajaneri anicut
- 6) Kanthakore anicut

Thirumanimuthar left arm alias Uppar river:

- 7) Muzhuveeran anicut
- 8) Vannimugandan anicut

Thirumanimuthar right arm alias Uppodai river:

- 9) Uppar bed dam
- 10) Bhiramanapatti anicut.

There are 5 Nos. of open off take in this river as detailed below: -

- 1) Sevalkulam kanmoi group (open off -take)
- 2) Velliankodunkulam open off -take
- 3) Ammanipudukulam kanmoi open off -take
- 4) Periasolaikanmoi open off -take
- 5) Natham to Uppar big dam open off -take

The tank and ayacut details are as follows:

In general, the following provisions have been made in this estimate.

1. Standardisation of tank bunds which are not in good condition.
2. Reconstruction / Repair of sluices after analysing weir present condition.
3. Reconstruction / Repair of weirs wherever necessary.
4. Construction of field channels based on requirements.
5. Rehabilitation of Existing Anicuts and Supply channels

Thirumanimuthar minor basin has to be rehabilitated to provide adequate water supply for irrigation. The total ayacut of this system comes to 2016.05 Hectare (inclusive of proposed rain fed tanks to be taken up in this project)

PALAR MINOR BASIN

The River has its origin from Mudhumalai of Natham taluk and Karanthamalai in Dindugal taluk. It traverses to a distance of 60 Km through 5 anicuts and empties in to Thiruppathur big tank. This minor basin having an Ayacut of 3351.01 Hect including PWD and other minor tanks. This minor basin area covers Melur and Thiruppathur taluks in Madurai and Sivagangai District.

Anicuts in this Basin are as follows

1. Rajakkal Anicut
2. Puthu Kanmoi Anicut
3. Matty Anicut
4. Kalappur Anicut
5. Boothani Anicut.

In general, the following provisions have been made in this estimate.

- Standardisation of tank bunds which are not in good condition.
- Reconstruction / Repair of sluices after analysing weir present condition.
- Reconstruction / Repair of weirs wherever necessary.
- Construction of field channels based on requirements.
- Rehabilitation of Existing Anicuts and Supply channels

Palar minor basin has to be rehabilitated to provide adequate water supply for irrigation. The total ayacut of this system comes to 2937.43 Hectare (inclusive of proposed rain fed tanks to be taken up in this project)

LAND USE PATTERN

(GEOPHYSICAL AREA)

SI. NO.	Land Use Category	Area in Hect.	% to the Basin Area
1	Forest	28713	10.04
2	Barren and uncultivable land	6404	2.24
3	Land put non- Agriculture use	43310	15.14
4	Cultivable waste	13021	4.55
5	Permanent pasture and grazing land	1446	0.51
6	Land under miscellaneous trees groves not included in sown area	6449	2.25
7	Current fallows	39503	13.95
8	Other fallow lands	54466	19.04
9	Net Area sown	92331	32.28

RAIN FALL DETAILS

Sl. No	Name of Rainfall Station	Average Annual Rain fall	Rain fall in mm		
			South West Mansoon	North East Mansoon	Summer and Winter
1	Natham	859.80	34.60	157.80	667.40
2	Thiruppathur	1176.81	496.42	441.23	239.16
3	Sivagangai	911.67	348.04	410.59	153.04
4	Karaikudi	985.22	390.60	425.03	170.03
5	Thiruvadanai	916.00	170.00	547.00	199.00
6	Melur	965.90	362.00	412.80	190.90
7	Devakottai	1201.43	500.33	555.22	145.88
8	Dindugul	774.90	83.20	124.50	567.20

METROLOGICAL DETAILS

Sl. No	Metrological Parameter	South West Monsoon	North East Monsoon	Winter	Summer
1	Mean monthly Temperature Max / min in ⁰ C	30/28.6	27.5/25.3	26.6/25.4	29.9/27.9
2	Average Monthly Temperature in ⁰ C	29.3	26.5	26.0	28.7
3	Average relative Humidity in %	70.8	79.7	76.8	73.9
4	Average Wind Velocity in kmph	11.3	10.2	12.79	13.3
5	Average Potential Evapotranspiration (calculated)	155mm/month			

WATER USER'S ASSOCIATION

There are 27 Nos of WUAs have been formed in Manimuthar Sub Basin. The Presidents and TC Members have been elected and functioning till date. Further 5 Nos of WUAs have to be included in these basin. Documentation for forming WUAs in all rain fed tanks in these basin have been complete d and kept ready for sending the proposal to the District collector to conduct election.

Conclusion:-

The project cost has been worked out based on the correct schedule of rates 2006 -07 of Sivagangai District. Action is being taken for the preparation o f the bid documents to implement the project after getting approval of the DPR.

FINANCIAL REQUIREMENT FOR MANIMUTHAR SUB BASIN

Sl. No	Department	Amount Lakhs
1	Water Resources Organization	5695.53
2	Agriculture Engineering Department	667.02
3	Agriculture Marketing Department	51.40
4	Agriculture Department	240.575
5	Animal Husbandry Department	138.18
6	Agriculture University	163.41
7	Horticulture Department	236.30
8	Fisheries Department	47.00
10	Environmental Cell	27.00
	Total Amount	7266.42

Total Project Cost 726.64 Millions

**Registered Ayacut
Partially Irrigated Area**

**16921
7851**

**Fully Irrigated
Gap**

**5802
3268**

Sl. No.	Crop	Without Project				With Project			
		FI	PI	Gap	TOTAL	FI	PI	Gap	Total
1	Fruit Plan								
2	Banana	100			250	100			300
3	Coconut	150				200			
4	Sugarcane		51		68				93
5	Fodder		17			93			
	Total								34
	Ist season		14		14	34			
	Paddy		28		38		100		158
	Maize		10			58			
	Vegetable								
	P.Juliflora	325	--	--	425	330		--	530
	Total	100				200			
	Fallow		100		100	200		--	200
	Total	675	220		895	1215	100		1315
	2 st season								
	Gingelly	5127	6453	1578	13158	12268			12268
	G.nut						150		150
	Pulses		96		96	116		--	116
	Vegetable		184		184	324		--	324
			868		868	1018		--	1018
			30		30		40	--	40
				1690	1690				1690
	Total	5127	7631	3268	16026	13726	190		15606
		5802	7851	3268	16921	14941	290	0	16921
		0	475		475	150	650		800
		0	800		800		1400		1400
		0				75			75
		0				55			55
		0	175		175		275	--	275
	Total	0	1450		1450	280	2325		2605
	Grand Total	5802	9301	3268	18371	15221	2615		19526

Sl.No	No. of tanks	Registered Ayacut (in Ha.)	Gap (Ha)
1	45	2529.76	396.10
	19	1278.39	366.10
2	170	7075.25	1311.90
	39	1084.31	201.10
3	102	2937.43	617.70
	0	0.00	0.00
4	42	1832.14	341.00
	4	183.91	34.10
	421.00	16921.19	3268.00

Sl.No	No. Of tanks	Registered Ayacut (in Ha.)	Gap (Ha)
1	359	14374.58	2666.70
2	62	2546.61	601.30
	421	16921.19	3268

PROPOSAL FOR TANKS UNDER IAMWARM FOR MANIMUTHAR SUB BASIN
List of tanks Abstract (Packagewise)

PROPOSAL FOR TANKS UNDER IAMWARM FOR MANIMUTHAR SUB BASIN
List of tanks Abstract

Sl. No	Particulars	No of Tank			Ayacut in Hect		
		Non system Tanks	Rainfed	Total	Non system Tanks	Rainfed	Total
1	Manimuthar Minor Basin	170	39	209	7075.25	1084.31	8159.56
2	Virusuliyar Minor Basin	45	19	64	2529.76	1278.39	3808.15
3	Thrumanimuthar Minor Basin	42	4	46	1832.14	183.91	2016.05
4	Palar Minor Basin	102	0	102	2937.43	0.00	2937.43
	Total	359	62	421	14374.58	2546.61	16921.19

Net Irrigation Requirement at Field Level in Mcum.(PRE PROJECT)

CROP	Area(Ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	Net water requirement of water		
															without Drip	With Drip	Total
Coconut - Per	250	0.31	0.25	0.31	0.25	0.00	0.17	0.19	0.36	0.33	0.25	0.19	0.19	2.80	2.11	2.1	4.21
Fruit Crops - Per	120	0.12	0.00	0.19	0.00	0.00	0.10	0.00	0.20	0.13	0.09	0.00	0.13	0.96	1.20	0.408	1.61
Paddy - Single crop - Sep	14848	18.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	57.09	29.74	37.51	142.70	269.25	-	269.25
Groundnut - Rabi - Jan	800	0.40	0.54	1.42	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	5.66	-	5.66
Chillies - Rabi - Jan	868	0.56	1.09	1.53	1.15	0.36	0.35	0.00	0.00	0.00	0.00	0.00	0.00	5.04	9.51	-	9.51
Vegetables - Rabi - Jan	310	0.21	0.46	0.47	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.23	2.32	-	2.32
Greengram - Rabi - Jan	475	0.24	0.51	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	1.91	-	1.91
Sugarcane 1	425	0.21	0.22	0.44	0.53	0.00	0.65	0.00	1.28	0.71	0.00	0.00	0.00	4.04	5.79	1.212	7.00
Cholam	100	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	-	0.09
Gingelly	175	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.02	0.00	0.00	0.00	0.00	0.11	0.21	-	0.21
	18371	20.41	3.07	4.62	2.71	0.36	1.36	0.19	1.86	1.17	57.43	29.93	37.83	160.94			301.77

M.Cum

Net Irrigation Requirement at Field Level in Mcum. (POST PROJECT)																Net water requirement of water		
CROP	Area (Ha)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	without Drip	With Drip	Total	
Coconut - Per	300	0.37	0.30	0.37	0.30	0.00	0.20	0.22	0.43	0.39	0.30	0.22	0.23	3.33	1.57	2.79	4.36	
Fruit Crops - Per	185	0.18	0.00	0.30	0.00	0.00	0.15	0.00	0.31	0.20	0.15	0.00	0.21	1.50	0.75	1.22	1.97	
Paddy - Single crop - Sep	14208	17.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	54.63	28.46	35.89	136.54	195.06	-	195.06	
Vegetables - Khariff - Jun	480	0.00	0.00	0.00	0.00	0.00	0.24	0.36	0.73	0.15	0.00	0.00	0.00	1.48	2.11	-	2.11	
Groundnut - Rabi - Jan	1400	0.70	0.94	2.48	1.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.25	7.50	-	7.50	
Chillies - Rabi - Jan	1018	0.66	1.28	1.79	1.34	0.42	0.41	0.00	0.00	0.00	0.00	0.00	0.00	5.90	8.43	-	8.43	
Vegetables - Rabi - Jan	130	0.09	0.19	0.20	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.52	0.74	-	0.74	
Greengram - Rabi - Jan	800	0.40	0.87	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.70	2.43	-	2.43	
Sugarcane 1	530	0.27	0.28	0.55	0.66	0.00	0.81	0.00	1.59	0.89	0.00	0.00	0.00	5.05	4.47	2.40	6.87	
Cholam	200	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.14	-	0.14	
Gingelly	275	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.04	0.00	0.00	0.00	0.00	0.18	0.26	-	0.26	
	19526	20.23	3.86	6.12	3.57	0.42	1.95	0.58	3.1	1.63	55.08	28.68	36.33	161.55			229.87	

M.Cum

WATER BALANCE

Name os Sub Basin

Manimuthar

	Pre Project	Post Project
Surface Run off	112.50 M.Cu.m	180.00 M.Cu.m
Ground Water	35.20 M.Cu.m	52.80 M.Cu.m
TOTAL POTENTIAL	147.70 M.Cu.m	232.80 M.Cu.m
<u>DEMAND</u>		
- Agriculture Demand (based on Cropwater Requirement Working Sheet)	301.77 M.Cu.m	229.87 M.Cu.m
Domestic Demand	10.50 M.Cu.m	10.50 M.Cu.m
Live Stock Demand	18.00 M.Cu.m	18.00 M.Cu.m
Industries Demand	8.24 M.Cu.m	8.24 M.Cu.m
TOTAL	338.51 M.Cu.m	266.61 M.Cu.m
Net Deficit	190.81 M.Cu.m	33.81 M.Cu.m

GENERAL ABSTRACT

Name of Project : IAMWARM

Name of Sub Basin : MANIMUTHAR

Name Of District : SIVAGANGAI
RAMANATHAPURAM

Project Cost : Rs 667.02 Lakhs

Sl No	Description Of Work	Physical Ha. / Nos	Unit Cost Ha. / Nos	Amount in Lakhs	Remarks
1	Trip Irrigation	735.000	37800.00	277.82	
2	Sprinkler Irrigation	900.000	15000.00	135.000	
3	Precision Farming	100	75000.00	75.000	
4	Bore wells with pipes	107.55	166900.00	17.950	
5	Farm Mechineries	120.00	84375.00	101.250	
6	Farm Ponds	150.00	40000.00	60.000	
	Grand Total			667.020	

DEPARTMENT OF
AGRICULTURAL MARKETING AND AGRI BUSINESS

Detailed Project Report (DPR)
Irrigated Agriculture Modernization and
Water Resources Management
(IAMWARM)

(Agricultural Marketing and Agri. Business component)

MANIMUTHAR SUB BASIN

NODAL OFFICER
ASSISTANT DIRECTOR OF AGRICULTURE (Marketing)
Madurai

AGRICULTURAL MARKETING AND AGRI BUSINESS.

1. LOCATION OF THE AREA.

The MANIMUTHAR Sub Basin covers the districts of Dindigul, Sivagangai, and Ramnad.

Irrigated Agriculture Modernization and Water Resources Management (IAMWARM) Project has been proposed based on the experiences gained through the implementation of WRCP in Tamilnadu. It involves an integrated approach with participation of Line Departments and the Water Using stakeholders with a Multi Disciplinary approach and principal objective of improving the after use efficiency thereby increasing the agricultural productivity and marketing prospects, along with additional benefits to the farming community .

II. EXISTING CROPPING SCENARIO :

Total Registered Ayacut:	16921 Ha.
Fully Irrigated Area:	5802 Ha.
Partially Irrigated Area:	7851 Ha.
Gap Area:	3268 Ha.

EXPECTED IMPACT OF THE PROJECT -MANIMUTHAR

S. No.	CROP	AREA		PRODUCTIVITY Kg PER Ha	PRODUCTION IN MT	MARKET ABLE SURPLUS %	MARKE TABLE SURPLU S IN MT
		WOP	WP				
1	Paddy	11580	11580	4000	46320	80.7	37380
2	Maize	0	838	1700	1425	98	1396.5
3	G.Nut	800	1400	1400	1960	96	1881.6
4	Gingelly	175	275	450	124	98	121.5
5	Pulses	475	800	600	480	83	398.4
6	Sugarcane	425	530	105	55650	100	55650
7	Coconut	250	300	.200 Lakhs nuts	60 Lakhs nuts	94	5640000
8	Horti.Crops						
	1.Mango	68	93	4778	444.354	100	444.354
	2.Amla	38	158	12075	1907.850	100	1907.850
	3.Sapota	14	34	10260	348.840	96	334.8864

	4.Bhendi	184	399	8970	3579.030	99.1	3546.8187
	5.Chillies	868	1018	12650	12877.700	97	12491.369
	6.Brinjal	96	166	13750	2282.500	99.9	2280.2175
	7.Watermelon	30	40	1555	62.200	100	62.200
9	Fodder	100	200	10750	2150	100	2150
10	P.Juliflora	1690	1690	13000	21970	100	21970
11	Fallow	1598	0				
	TOTAL	18391	19521				

III. EXISTING MARKETING SCENARIO.

1) INFRA STRUCTURE: At present the available infra structures are very minimal and insufficient. The available infrastructures are as listed below.

There are storage godowns available at the following Regulated Markets.

Sl.No	Location	Godown Size	Nos	Capacity	Total Capacity	U
1	Singampunari	25*18 Mts	3	1000 Mt.	3000 Mt.	
2.	Devakottai .	25*18 Mts	2	1000 Mt.	2000 Mt.	Agri
3	Karaikudi	25*18 Mts	2	1000 Mt.	2000 Mt.	Co
4	Thiruvadanaai.	25*18 Mts	1	1000 Mt.	1000 Mt.	

In addition to this Co-operative societies have seven Godowns.

Co-operative Godowns are available at S.Pudur, Singampunari, Thiruppathur, Kallal, Karaikudi, Devakottai & Thiruvadanaai with a storage capacity of 500 Mt.each totaling to 3500 Mt of storage facility.

Drying yards cum Threshing Floors. There are Four Threshing floors available located one in each of Singampunari, Karaikudi, Devakottai & Kannangudi. Where there is no pucca drying yard and Threshing floors. Farmers use earthen drying yards and threshing floors for their drying and threshing operations. They also use Highways and Village roads for threshing operations causing inconvenience and public hazard to the general public besides causing adulteration and loss of quantity of the harvested produce.

2) MARKETS: EXISTING

Only General Markets are available. Paddy which is the main crop of this area, and other produces such as Pulses Maize, etc. except vegetables and sugarcane find their markets through local whole sale commission mandies located in the respective area with major mandies located at Singampunari, Thiruppathur, Karaikudi, Devakottai and Thiruvadana.

For vegetables, there are separate commission mandies in the respective areas in addition to weekly shandies which are spread throughout the area. The weekly shandies for vegetables are at Singampunari, Thiruppathur, Karaikudi, kallal, Devakottai and Thiruvadana.

Regulated markets are located at Singampunari, Devakottai, Karaikudi, and Thiruvadana

Sakthi sugars located in Padamathur purchases the sugarcane directly from the farmers through contract farming.

The crushing capacity of M/S. Sakthi sugars is around 4 thousand mt per day and at present only 3 thousand mt per day is crushed for 270 days per year. Therefore there are ample chances to cover the increased production of sugarcane produced additionally per year; Even though the supply is made from the adjoining Kottakaraiyar Sub basin, the demand for Sakthi sugars will be more in future.

Regulated Markets.

s No.	Location	Infra structure Available	Notified Crops Cotton, Groundnut, Chillies, Pady,Cholam Cumbu,Ragi,Blackgram Corriander &Coconut.	Receipts and Expenditure for the Last Two years (Rs. in Lakhs)			
				2004 - 05		2005 - 06	
				Receipts	Expen diture	Receipts	Expen diture
1	Singampunari	.		6.24	2.71	6.86	2.55
2	Devakottai .			4.36	2.24	7.52	2.03
3	Karaikudi			7.07	2.00	7.61	2.27
4	Thiruvadana.			6.12	2.12	9.09	2.14

MARKET FEASIBILITY FOR THE CROPS PROPOSED IN DIVERSIFICATION IN THE SUB BASIN

Establishment of food park in Virudhunagar has provided copious demand for chillies , maize & pulses which are also low – water requirement crops, compared to paddy. Hence marketing prospects for these crops are bright in future.

a. CHILLIES:

For chillies the Virudhunagar chillies merchant M/S. V.P.S.A and Sons have set up a chillies oil extraction plant at Virudhungar. The requirement for this plant is around 2 to 5 thousand mt per year. Further discussions with them revealed that their total requirement is around 40 thousand mt. and of this 20 thousand is procured from Karnataka and 12 thousand mt from Andra Pradesh, leaving the balance of 8 thousand mt per year which is procured from our state. Thus there is ample chance to market the enhanced chilli production. They have their purchase centers located in this sub basin area through the commission agents and private mandies. The local market has a very good demand for green chillies.

M/S. Arumuga group of companies located in Rajapalayam have erected one export oriented ground spices masala factory in Rajapalayam. They also come forward to procure chillies from this sub basin. They have been contacted by the marketing officials and no difficulty in marketing the entire product is anticipated.

b. MAIZE:

The total requirement of maize in our State is around 18 lakhs mt. At present we are producing only 6 lakh mt per year in this State. We procure maize from Karnataka and Andhra Pradesh. Maize is harvested during Nov - Dec in Karnataka while in Tamil Nadu the harvest is in Jan -Feb and during this period there is a heavy demand since it is in off season. So it fetches remunerative price to the farmers. The main purchasers are M/s. Suguna, and M/S. Pioneer, based at Coimbatore and M/S. S.K.M based at Namakkal Even the additional production will actually be less than the requirement of our State and hence the marketability will be bright and assured with remunerative prices around Rs. 6 to 7 per Kg.

The Production of paddy is estimated at 46320 M.T. with a marketable surplus of 37380 M.T. The average Rate per Quintal prevailed at Rs. 600/= per Quintal.

The production of Sugarcane is estimated as 55650 MT and it is being purchased by M/s. Sakthi Sugars at the rate of Rs. 1000/= per tonne.

The Market Prices for other commodities are:

1. Ragi. Rs.350-400 per quintal.
2. Cumbu. Rs.375-425 per quintal.
3. Cotton. Rs.1500-1700 per quintal.

4. Pulses. Rs.1400-1600 per quintal.
5. Chillies Rs.2500-2800 per quintal
6. Groundnut Rs.1000-1200 per quintal
7. The rate of vegetables ranged from Rs.6 to 10 per kg.

4) PRACTICES (PRE AND POST HARVEST)

In general no pre harvest practice is followed.

For sugar cane thrashing of leaves and packing of soil in the root zone is practiced. Stacking the sugarcane with each other is also practiced in few areas to avoid wind damage.

For Ground nut weeding and packing of soil near the root zone is practiced for better pod formation.

For vegetables like bhendi and brinjal, Integrated plant protection measures are extensively taken to protect the crop against pest

A) GRADING is not at all practiced in a Scientific way for all produces. In the case of cotton, good Kappas and the Kottu paruthi are heaped separately in the space available within the house. Likewise in Chillies the pest and disease attacked and immatured are separated manually and stored in heaps after sun drying them. In paddy proper manual winnowing is done to segregate immatured defectful grains and foreign matter.

It is properly dried and stored in the existing storage facilities available with the household.

B) TRANSPORTATION.

No Specific difficulty is experienced. The produces are transported generally by Vans and Lorries for paddy, Groundnut Etc. Vegetables are transported by Two Wheelers to the nearest markets.

C) CONTRACT FARMING is done in sugarcane. M/S. Sakthi sugars enters into contract with the farmers for the cultivation and purchase of Sugarcane at the rate fixed by the Government ie Rs.1000 per mt at 8.5 % sugar recovery. For other crops at present no contract farming is practiced. In future it is suggested for crops like cotton, vegetables especially tomato.

D) SOURCE OF MARKET INFORMATION For all crops except sugarcane it is only through word of mouth and as such there is no other means of marketing information except a few prices of specific commodities given in daily news papers and AIR which of course has little impact on the farmers of this area. Wholesale merchants use telephone facility to know the day -to-day price fluctuation in other connected areas.

The price of sugarcane is fixed by the M/S. Sakthi Sugars as indicated above and it is let known to the farmers through the factory cutting orders. It is somewhat higher than the support price announced by the government.

The trend of market prices of field and commercial crops can be known through AGMARK NET facility in computers installed at Regulated Markets of Singampunari, Karaikudi and Devakottai.

IV. CONSTRAINTS

1. CONSTRAINTS in the Existing scenario

- a. The output is almost at the same time due to seasonal cultivation of crops.
- b. No collective action in marketing and individual farmers take their decisions.
- c. No commodity is graded scientifically and rough methods only are used.
- d. But for word of mouth the people have no other access to market information
- e. Transportation becomes laborious in remote villages and at the mercy of bullock carts.
- f. Blind faith with traditional market methods and based on the relationship developed with the whole sale mandies over years.
- g. The need for immediate cash and the binding to sell the produce with the particular wholesale mandy for loans taken from them for cropping.
- h. The absence of fruit or vegetable based industry.

V. DIVERSIFICATION / FUTURE VISION PROPOSED

In order to save water and bring the 3268 Ha of gap area under irrigation, it is proposed to cut down the existing area. The diversifications are proposed by the Departments of Horticulture and Agriculture. The Department of Horticulture has proposed to increase the area of vegetables to the tune of 450 has and 65 ha in case of fruits.

The Agricultural Department has proposed to cover 3268 ha in Gap area and diversification area with less water consuming crops such as maize and pulses.

The Animal Husbandry has proposed to grow fodder in 200ha.

VI. CHALLENGES THROWN UP BY DIVERSIFICATION / AREA EXPANSION.

1. Better utilization of existing markets especially the Regulated Markets.
2. To ensure better bargain Multiple Market Information may be provided to the farmers for all crops.
3. Collective Marketing may be admonished (through WUA sub groups)
4. Collective transportation of commodities instead of individual transportation in small quantities.
5. Dissemination of information, education, and communication about new methods of product handling, grading, packing of farm produces and quality control standards.
6. Educating the fruit and vegetable growers in knowing the computer operations, so that international and export marketing facilities can be given through APEDA like institution & internet facility.

VII. SOLUTIONS AND RECOMMENDATIONS:

1.Consultative process undertaken in the sub basin:

A Walkthrough survey was conducted on 11.08.06 along with the PWD and other Line Depts. The farmers are of the opinion that they are forced to sell their produce,(The main crop in this area is Paddy which stands in an area of 13158 ha.) at rock bottom prices since they are unable to hold the produces for want of proper scientific storage facilities. They also feel that they do need good drying yard and a pucca threshing floor. At present they use the High ways road and other roads for threshing operations which causes inconvenience to the general public as well as to the vehicles besides adulteration and loss of quantity of grains.

2. Stakeholders Demands: 1.Storage Godowns.

2. Threshing Floor.

3. Multiple Market information and

4.Agricultural Business Centre.

3. Marketing interventions proposed with reference to the identified constraints.

Marketing Interventions proposed

Soft ware

- Linkage with traders on contract farming terms to be explored
- FIGs.(Farmer Interest Groups) at WUA level and commodity groups
- Capacity Building, IEC.
- Diversification of crops ie. Paddy to maize cap area coverage
- Price information system.

Hardware

- I.T Kiosks - 5 places
- Collection centres - 2 places
- Threshing floors - 7 and storage godowns – 5

S No	Crops	Constraints and Challenges.	Counter Measures.
1	Paddy Pulses Ground nut, Chillies	a. Production: Out put at the same time	1. Storing the commodities in storage Godowns after proper drying and packing to sell them in off season when the prices are at peak.
		b. Poor post Harvest practices.	By providing proper threshing and drying yards and educating the farmers about healthy post harvest techniques this problem could be solved.
		c. No collective action.-Individual farmers go to market / Wholesaler.	The WUA of that area may be given IEC through TNAU experts about collective marketing. FIGS to be formed – commodity Groups.

2.	Vegetables	Improving existing market utilization.	<ol style="list-style-type: none"> Multiple market information may be provided through AIR, News letters and through block offices. Farmers may be educated to understand the use and better benefits of collective marketing and to operate the internet facility. They may be advised to have a single and big transport mode for their group rather than having them for each farmer. The WUA may be motivated to bargain in price for their produce rather than the trader dictating the terms. The WUA can be motivated to sell the produce through Regulated Market where there will be no commission, weighing charges, mahimai etc. They may be advised to avail the pledge loan facilities of the Regulated market by which the urgent need for money may be met with.
		Production Glut / Shortage.	<ol style="list-style-type: none"> Staggered planting so as to ensure uniform supply of all vegetables throughout the year. The farmers may use uzhavar shandai. to sell the vegetables where there will be no commission, and the farmers are at liberty to sell their produces at the price fixed by the uzhavar shandai which will fetch them good remuneration. The transport is also cheap and timely since the Govt. is plying special buses to uzhavar shandai. Mixed vegetable cultivation may be done instead of one single vegetable.

COMPONENTS PROPOSED:

Paddy is the major crop cultivated in the Manimuthar sub basin area. Paddy crop at present occupies 13158 Ha with a total production of 41619 MT every year. The Marketable surplus of paddy is 33586 MT. The marketable surplus of Pulses, Ground nut, Chilies and Millets are 11594 MT At present the farmers are forced to sell their produces then and there for want of storage facilities. Out of this nearly 60% of the marketable surplus will be sold immediately. Farmers have small storage facilities built within the house and taking into consideration, the available storage facilities as discussed above, it is arrived at the conclusion, through discussions with farmers that five numbers of storage godowns may be constructed in the areas where there is congregation of agricultural activities. It will help the farmers to store their produces when the price dips in and to sell them when the price is remunerative.

The farmers also feel that they do need good drying yard cum threshing floors. At present they use the Highways roads and other village roads for drying and threshing operations which causes inconvenience to the general public as well as to the vehicles and also the products obtained from such unhealthy drying and threshing practice is not clean and not worthy of a good remunerative price. So it is proposed to construct 7 Drying yards in places where there is congregation of harvested produces.

S.No.	Description	Qty.	Rate.	Amount in lakhs
1	Thrashing / drying yard	7 Nos	2.2 lakhs each	15.40
2	Storage Godowns	5 Nos	5 lakhs each	25.00
3	Agricultural business centre	1 No	11	11.00
TOTAL				51.40

A total sum of Rs.51.40 lakhs is to be provided for this project.

The Detailed estimates for the above infrastructures are enclosed herewith.

The Sub basin map is also enclosed.

Reasons for selecting components:

With project being implemented in future, the rise in area of chillies and maize will enhance productivity and profitability of the crops. Harvested produce can be readily disposed off, if organized infrastructure, like market godowns drying cum threshing floors are provided to the farmers. Hence the procurement can be done in pooled manner by farmers in an organized manner. If a better (or assured) price has been got in future, the cropping intensity and marketing scenario (like utilization of marketing infrastructure i.e. Godown and drying yard, threshing floor etc.) will give positive responses to the farmers.

Increase in fruits and vegetable production will provide an opportunity for quick disposal through these godowns.

The Storage Godowns are proposed to be built in,

1. S. Pudur
2. Thirupathur
3. Kallal
4. Kannankudi
5. Mangalakudi.

And the Drying yard cum threshing floors are proposed to be laid at

1. S.Pudur
2. Vetriyur
3. Kallal
4. Thiruppathur
5. Mangalakudi
6. Thiruvadanai
7. Thirupparkottai.

Marketing strategy to be adopted with reasons

Being the major revenue, generated through foreign exchange, depending on agricultural produce, we can improve the cropping pattern to a certain extent, by rejuvenating water use efficiency measures.

Even though Manimuthar sub basin is dominated by Paddy, it can be replaced by adopting suitable crop-rotation with less water requirement crops like maize and pulses.

The present marketing infrastructure consists of four regulated markets, besides a number of private mandies. The transportation is by means of private channels. Grading and quality control is very limited or we can say, neglected. Specialized storage godowns, market information system and agro-based industries are conspicuously absent in this basin area.

The marketing strategy is based on the following three items.

1. Survey of existing cropping / marketing scenario
2. Stakeholders consultation
3. Deciding on suitable marketing components based on gap area.

It is proposed to set up one Agri.Business centre at Karungalakkudi village of Kottampatty Block of Manimuthar Sub-basin where chillies and ground nut are raised with an area of 132 Ha and 275 Ha respectively. This village site is 25 Kms from Singampunari Regulated market, 77 Km from Karaikudi

Rebulated market, 67 Km from Devakottai Regulated market and 98 Km from Thiruvadanai Regulated market.

The Annual production of chillies is expected around 250 to 300 mt and Groundnut 2000 mt. Chillies is raised as first crop during sep-jan and groundnut as second crop during jan -april.

Hence it is proposed to have one Agricultural Business centre at a cost of Rs.11.00 Lakhs as detailed below.

ESTIMATE FOR AGRICULTURAL BUSINESS CENTRE.

S.No.	COMPONENTS	COST IN LAKHS
1	Lab cum Admin	1.00
2	Grading cum Storage Shed	5.00
3	Electricity, Water supply	1.50
4	Drying yard	2.20
Equipments		
5	Moisture meter, Weighing machine	0.30
6	Dunnage (At Rs. 2000 each * 30 Nos.)	0.60
7	Tarpaulin (At Rs.5000 each * 2 Nos.)	0.10
8	Recurring Expenses	0.30
	TOTAL	11.00

Phasing of Expenditure

The Expenditure will be phased out as follows.

S No	Components	YEAR					Total Components	Amount Rs. in Lakhs
		I	II	III	IV	V		
1	Thrashing / drying yard	-	-	7	-	-	7	15.4
2	Storage Godowns	-	-	5	-	-	5	25.0
3	Agricultural business centre	-	-	1	-	-	1	11.0
TOTAL		-	-	13	-	-	13	51.4

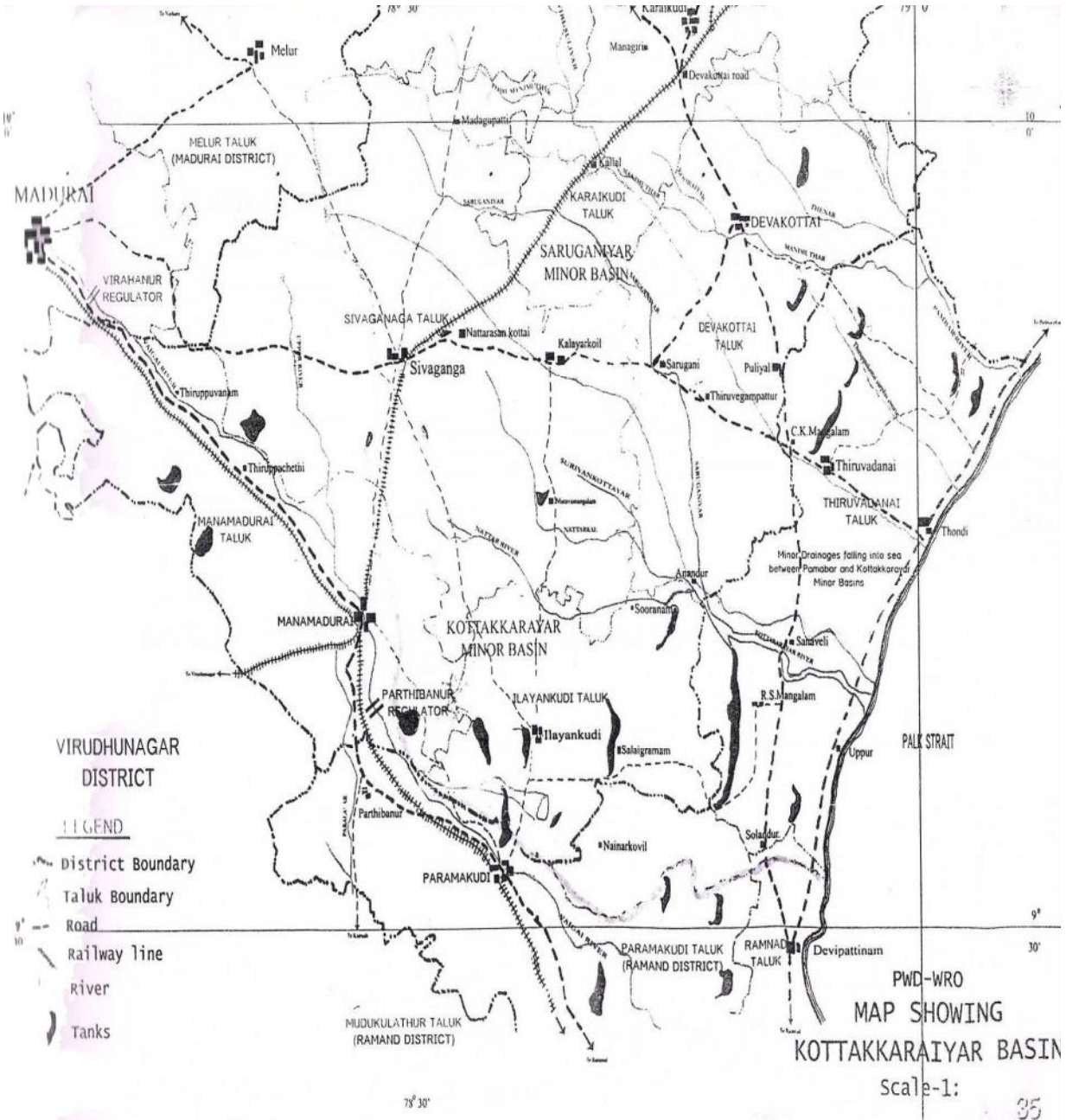
**DETAILED
PROJECT REPORT FOR
IRRIGATED AGRICULTURE
MODERNISATION & WATER RESOURCES
MANAGEMENT (IAMWARM)
PROJECT
SIVAGANGA DISTRICT
MANIMUTHAR BASIN**

DEPARTMENT OF AGRICULTURE
SIVAGANGA DISTRICT

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MAP SHOWING KOTTAKARAIYAR BASIN



In Sivaganga District the IAMWARM Project is to be implemented in Basin namely Manimuthar, which consist of

4 Minor basin namely Manimuthar, Virusuliyar, Thirumanimuthar and Palar.

MANIMUTHAR BASIN :: 16921 Ha.

The Manimuthar basin covers Devakottai, Kannankudi, Sakkottai, Thiruppattur and Singampunari block in Sivaganga District.

Total Number of tanks : 421
Total area : 16921 Ha.

It has been proposed to develop the area coming under the above basins by various line departments in a phased manner.

Based on the guidelines for the above project, Agriculture Department has proposed to implement the following components for increasing the production and income of the farmers.

I. Existing Agriculture crop Scenario

1. Agriculture Crop & Varieties :
Paddy – Bpt5204, ADT 39, ADT 43, TRY 1, MDU 5
2. Area : 11580 Ha
3. Production : 46320 MT (Rice)
4. Productivity : 4000 Kg/Ha (Paddy) 2838 kg/ha(Rice)

Existing Agriculture practices

Inputs

Seed

High yielding varieties are used which is supplied from Agriculture Department and Private. Seeds supplied from 17% from Department , 40% from Private dealer 43% from seed villages.

Soil Testing

Soil testing Lab, Mobile Soil testing lab and KVK are available for analyzing the samples.

INM and IPM

INM and IPM implemented in paddy and sugarcane crop 20 – 30% of the area covered in ICDP and Sugarcane Development schemes.

Extension

Extension services for the basin by the Department through Agricultural Development officers Agricultural officers Assistant Agricultural officers Extension officers is looking after 800 hectares.

II. Practices

Irrigation

Season	-	Oct-Jan
Source	-	Rain
Quality	-	Good
Irrigation	-	Flood

Pre and Post Harvest

Fifty Percentage area harvest by labours and Fifty percentage by Machineries. Only 10% Storage facilities are available in this Pambar basin.

Labour

At the time of weeding and harvesting major shortage of labour occurs

Agri processing and Factories

Modern rice mills and rice bran oil extraction factories are available.

III. Constraints

a. Problem soil

Patches of saline, alkaline and acid soil exist in scattered manner and accounts for 2 -3% of the total ayacut area.

b. Adverse climatic condition

Drought : Mostly the available rain is erratic and the receipt of the north east monsoon decides the fate of the paddy crop.

c. Improper Irrigation

The Ayacut farmers flood the fields which have poor drainage resulting in poor growth and yield of the crops.

d. Inadequate Extension

As there are only limited extension staff of Government , NGO' sand KVK are functioning presently. Farmers are not able to meet out the requirement for TOT, input supply and settlement of field problems.

e. Proper adoption of technologies

The awareness among the farmers towards adoption of latest technology is lesser especially IPM/INM and post harvest practices. Training of farmer in this aspect will improve the adoption

f. Limited availability of credit facilities

The availability of credit facility is low , and the farmer repaying capacity is poor due to the failure of monsoons.

IV. Diversification/ Future vision Proposed

In the post project scenario due to increased in the water use efficiency and extended availability paddy will be the predominant crop and diversion to crops like sugarcane, pulses and oil seeds will be very minimum.

V. Challenges thrown up by diversification / Area Expansion

Ensure water availability – after the project, the gap area and partial irrigated area covered into fully irrigated area.

VI. Solution and Recommendation

Soil reclamation

In the basin acid and saline soil are available, there is specific recommendation of lime and gypsum application at 70% cost.

TIP (Technical Input provider)

Agri clinic – provide one or two Agri clinic for the basin.

MANIMUTHAR BASIN

Sl.No.	Name	No. of Tanks	Area Ha.
1.	Manimuthar	421	16921
	Total Ayacut		16921
	Fully irrigated		5802
	Partially irrigated		7851
	Gap		3268

CROPPING PATTERN FOR MANIMUTHAR

FIRST CROP	
EXISTING	PROPOSED
Paddy (Sep. - Jan.)	Paddy (Sep. - Jan.)
	Maize (Nov. - Jan.)
	Vegetables (Sep. - Jan.)
SECOND CROP	
Pulses (Jan. - Feb.)	Pulses (Jan. - Mar.)
Groundnut (Nov. - Jan.)	Groundnut (Feb. - May.)
Gingelly (Dec. - Jan.)	Gingelly (Jan. - Mar.)

CROPPING PATTERN - MANIMUTHAR BASIN (Area in Ha.)

Crop	Without Project				With Project				Increasing
	FI	PI	GAP	Total	FI	PI	GAP	Total	
Fruit Plan	0	120	0	120	285	0	0	285	165
Coconut	250	0	0	250	300	0	0	300	50
Sugarcane	425	0	0	425	530	0	0	530	105
Fodder	0	100	0	100	200	0	0	200	100
Total	675	220	0	895	1315	0	0	1315	420
1st season									
Paddy	5127	6453	0	11580	11580	0	0	11580	0
Maize	0	0	0	0	838	0	0	838	838
Vegetables	0	1178	0	1178	1498	0	0	1498	320
P. Juliflora	0	0	1690	1690	0	0	1690	1690	0
Total	5127	7631	1690	14448	13916	0	1690	15606	1158
Fallow	0	0	1578	1578	0	0	0	0	0
Total	5802	7851	3268	16921	15231	0	1690	16921	1158
2nd season									
Gingelly	0	175	0	175	0	275	0	275	100
G.nut	0	800	0	800	0	1400	0	1400	600
Pulses	0	475	0	475	150	650	0	800	325
Vegetables	0	0	0	0	125	0	0	125	125
Total	0	1450	0	1450	275	2325	0	2600	1150
G.Total	5802	9301	3268	18371	15506	2325	1690	19521	2728
Cropping intensity				89%				115%	

**PRODUCTIVITY AND PRODUCTION OF WITHOUT PROJECT
MANIMUTHAR BASIN**

Sl.No.	Crop	FI	PI	Total	Productivity per Ha	Total Production (in MT)
First Crop						
1	Paddy	5127	6453	11580	3.195	36998
2	Sugrcane	425	0	425	87	36975
3	Coconut	250	0	250	0.1597	40 lakh nuts
Second Crop						
1	Gingelly	0	175	175	0.318	56
2	G.nut	0	800	800	0.99	792
3	Pulses	0	475	475	0.367	174

**PRODUCTIVITY AND PRODUCTION OF WITH PROJECT
MANIMUTHAR BASIN**

Sl.No.	Crop	FI	PI	Total	Productivity per Ha (MT)	Total Production (MT)
First Crop						
1	Paddy	11580	0	11580	4.00	46320
2	Maize	838	0	838	1.70	1425
3	Sugrcane	530	0	530	105.00	55650
4	Coconut	300	0	300	0.2 lakhs nuts	60 lakh nuts
Second Crop						
1	Gingelly	0	275	275	0.45	124
2	G.nut	0	1400	1400	1.4	1960
3	Pulses	150	650	800	0.6	480

EXPECTED IMPACT OF THE PROJECT - MANIMUTHAR BASIN

S. No.	Crop	Area			Productivity(Kg / Ha)			Production in Mt			Income of Project in lakhs		
		WOP	WP	INCRS	WOP	WP	INCRS	WOP	WP	INCRS	WOP	WP	INCRS
1	Paddy	11580	11580	0	3195	4000	805	36998	46320	9322	1850	2316	466
2	Mize	0	838	838	0	1700	700	0	1425	1425	0	85.4	85.4
3	G.nut	800	1400	600	990	1400	450	792	1960	1168	118.8	302.4	184
4	Gingelly	175	275	100	320	450	130	56	124	68	19.6	43.4	24
5	Pulses	475	800	325	367	600	233	174	480	306	52.2	144.0	92
6	Sugarcane	425	530	105	87	105	80	36975	55650	18675	393.4	592.1	199
7	Coconut	250	300	50	0.159 L.Nuts	0.2 L.nuts	0.041 L.nuts	0.040 L.nut	0.060 L.nuts	0.020 L.nuts	139.7	210	70.4
8	Horti.crop	1298	1908	610									
9	Fodder	100	200	100									
10	P.Juliflora	1690	1690	0									
11	Fallow	1598	0	0									
	Total	18391	19521	2728							2573.65	3693.3	1119.65

PROPOSED COMPONENTS

1. TECHNOLOGY DEMONSTRATION

After getting the area under fully irrigated the farmer to get higher profit, the technology demonstration laid in the basin adopting high yielding variety of Paddy, Pulses, Maize, Groundnut, seed treatment, biofertilizer, inorganic biofertilizers, Mn mixtures and other essential inputs. The new crop of maize is to be introduced as a focusing crop to the basins for development.

2. DISTRIBUTION OF BIOFERTILIZERS

To reduce the use of inorganic fertilizers, use biofertilizers like Azospirillum and Phosphobacteria to compensate N and P.

3. BUND CROPPING WITH PULSES

To increase the beneficial insects population and get additional income to the farmers.

4. ORGANIC FARMING DEMONSTRATION

To reduce the environmental pollution and increase the beneficial micro organisms to get the sustainable yield. Only Organic fertilizers are used and foliar application of micronutrients.

5. SUPPLY OF MN MIXTURES

To overcome micro nutrient deficiency and to avoid low yield. To reclaim alkaline saline and acid soils to get more yield.

6. SUSTAINABILITY OF SOIL HEALTH

To sustain the soil health in the project area it is proposed to analyse the status of major and micro nutrient available in the soils of the area with reference to the crops to be cultivated and specific recommendations to improve the productivity are to be made by issue of soil health cards as a permanent record.

7. EXPOSURE VISITS TO THE FARMERS

With a view to expose the farmers to the latest proven technologies, Exposure visits are proposed to the Agricultural Research Institution and relevant demonstration areas within and outside the state.

8. DOCUMENTATION, PUBLICITY AND PROPOGANDA

To popularize the technologies and the scheme components among the farmers, Hoardings, Banners, Booklets, Phamplets and extension materials are proposed to be utilised in the project area. Scheme orientation campaigns and field days are also proposed to be conducted. All the activities are to be documented with photographs, Videos / CD's and Performance Reports. Hence provision has been requested for documentation and publicity

9. CAPACITY BUILDING FOR TOT

It is proposed to depute the Nodal Officer and Implementing Officer for TOT training in Tamilnadu Agricultural University, Coimbatore and other relevant institutions for capacity building of the officers.

10. CREATION OF TRAINING HALL CUM INPUT STORAGE FACILITIES

Since this scheme involves hundreds of farmers and inputs distribution to thousands of Hectares in phased manner, creation of a place for training and inputs storage for the farmers is considered essential. Hence provision has been requested for a building for every 5000 Ha.

11. PROVISION OF NETWORKING SYSTEMS AND STAFF ON CONSOLIDATED PAY

Since this scheme involves multi various works like Preliminary Survey, Orientation, Selection of beneficiaries, Distribution of inputs, lay out of demonstrations, Collection and Compilation of Data for analysis, interpretation and presentation. Separate staffs on consolidated pay is considered essential for both technical and networking operations. Hence one technical person and one clerical person with computer knowledge are proposed for every basin.

12. PROVISION OF CONVEYANCE FOR EFFECTIVE IMPLEMENTATION AND SUPERVISION

Since this scheme involves heavy outlay and vast area it is considered that for effective implementation and supervision Nodal Officers may be given provision for hiring vehicles on need basis.

COMPONENTS PROPOSED TO MANIMUTHAR BASIN FOR FIVE YEARS INPUTS DISTRIBUTION AND DEMONSTRATION

Sl. No.	Component and Assistant to farmers	Assistance	Proposed plan for five year			
			Phy (Ha)	Farmer	Govt	Total
1	Paddy tech.dem @Rs5000/Ha-	50%	1500	37.5	37.5	75
2	Maize tech.dem @Rs5400/Ha	100%	800	0	43.2	43.2
3	Pulses tech.dem. @Rs 3700/Ha	50%	500	9.25	9.25	18.5
4	Groundnut tech dem @ Rs 6000/Ha	50%	250	7.5	7.5	15
5	Biofertiliser Dem @ Rs 150 / ha	50%	1250	0.9375	0.9375	1.875
6	Organic farming dem.@ Rs10000/No	100%	50	0	5	5
7	Soil health card @ Rs 10 / No	100%	15000	0	1.5	1.5
8	Mn mixer dem.@ Rs 160 / Ha	50%	5000	4	4	8
9	Pulses bund cropping dem @ Rs.200/Ha	50%	2000	2	2	4
	Total			61.1875	110.8875	172.075

OTHER COMPONENTS PROPOSED TO MANIMUTHAR BASIN FOR FIVE YEARS

S.NO	Component Details	Assistance in L.Rs
1.	Exposer visit @ Rs 800 per farmer	2
2.	Documentation and publicity	2.5
3.	Capacitybuldind	5
4.	Creation of training hall and storage godown	50
5.	Provision of net working system and staff on consolidated pay	6.5
6.	Provisionof conveyance	2.5
	Total	68.5

ABSTRACT

PROPOSED EXPENDITURE DETAILS

MANIMUTHAR BASIN

Sl. No.	Component Details	I Year	II Year	III Year	IV Year	V Year	Total
1.	Agricultural Inputs distribution & demonstration assistance	36.174	33.474	33.474	33.474	33.474	172.075
2.	Other components expenditure assistance	54.100	3.600	3.600	3.600	3.600	68.500
	Total	90.274	37.074	37.074	37.074	37.074	240.575

ANNEXURE

SPLIT UP DERTAILS FOR COMPONENTS

I	Paddy Technology Demonstration (Ha)	(Norms as per ICDP Rice)
1.	Seeds 50 kgs/ Ha @ Rs. 12.50/ Kg	Rs. 625
2.	Seed Treatment T. Viridi 0.5 kg @ Rs.80/Kg	Rs. 40
3.	Nursery DAP 20 Kgs Rs.10/Kg	Rs. 200
4.	Biofertilizers 25 Nos/Ha @ Rs.6/No.	Rs. 150
5.	BGA 10Kgs/Ha @ Rs. 3/Ha	Rs. 30
6.	Gypsum 500 Kgs/Ha @ Rs. 1/Kg	Rs. 500
7.	MN Mixture 12.5Kgs/Ha @ Rs. 20/Kg	Rs. 250
8.	NPK fertilizers Urca 275 Kgs Super 310 Kgs MOP 85 Kgs	Rs. 1375 Rs. 1125 Rs. 400
9.	Agadiractine 2.5 lit/Ha @ Rs. 100/lit	Rs. 250
10.	Pulses seed 3Kg/Ha @ Rs. 50/Kg	Rs. 150
	Total	Rs. 5095
	Limited to	Rs. 5000

II. Maize Technology Demonstration (Ha)		(Norms as per ISOPOM)
1.	Seeds-20Kgs/Ha @ Rs.65.00 /Kg	Rs.1300
2.	Field Application Biocides 2.5Kg @Rs.80/Kg.	Rs. 200
3.	Biofertilizers 25 Nos @ Rs.6/Pocket	Rs.150
4.	MN Mixture 12.5Kg @ Rs.20/Kg	Rs.250
5.	Application of Urea 300 Kgs	Rs.1500
6.	Super 400 Kgs	Rs.1450
7.	M.O.P 85 Kgs	Rs. 400
8.	Bund cropping 3 Kg @ Rs 50 /Kg	Rs.150
	Total	Rs.5400

III . Pulses Technology Demonstration (Ha) (Norms as per ISOPOM)

1.	Seeds-20Kgs/Ha @ Rs.30/Kg	Rs.600
2.	Field Application Biocides 2.5Kg @Rs.80/Kg.	Rs. 200
3.	Biofertilizers 25 Nos @ Rs.6/Pocket	Rs 150
4.	weedicides @ 1.5 Lit	Rs 750
5.	MN Mixture 12.5Kg @ Rs.20/Kg	Rs.250
4.	Application of Urea 55 Kgs	Rs.300
5.	Super 320Kgs	Rs1200
6.	D.A.P Spraying	Rs350
	Total	Rs.3700

IV. Ground nut Technology Demonstration (Ha) (Norms as per ISOPOM)

1.	Seeds-200Kgs/Ha @ Rs.25/Kg	Rs. 5000
2.	Field Application Biocides 2.5Kg @Rs.80/Kg.	Rs. 200
3.	Biofertilizers 25 Nos @ Rs.6/Pocket	Rs.150
4.	MN Mixture 12.5Kg @ Rs.20/Kg	Rs.250
5.	Application of Gypsum 200 Kgs	Rs.300
6.	Field days	Rs.100
	Total	Rs.6000

V. Organic Farming Demonstration (Ha)**(New technology)**

1.	Green Manure Seeds 30Kgs @ Rs.20/Kg	Rs.600
2.	FYM 2 MT @ Rs.700/MT	Rs.1400
3.	Vermicompost 2 MT @ Rs.4/kg	Rs.8000
	Total	Rs.10000

VI. Distribution of Bio Fertilizers**(Norms as per ISOPOM)**

1.	Bio Fertilizers 25Nos./Ha @ Rs.6	Rs.150
----	----------------------------------	--------

VII. Bund Cropping with Pulses

1.	Seeds 5Kg/Ha @ Rs.40/Kg	Rs.200
	Total	Rs.200

VIII. Supply Of MN Mixture**(Norms as per ICDP(Rice)
& ISOPOM)**

MN Mixture 12.5Kg/Ha @ Rs.12.80	Rs.160/-
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IX. Soil Health Cards

Analysis of Macro and Micro Nutrients Status of Rs.10/Sample

X. Exposure Visit**(Norms as per RSVY Scheme)**

Visit to Research Station for 2 days (50 farmers/batch) Rs.40000

50 farmers @ Rs.800/Farmer

(Including Transport Charges, Accommodation, Food, Honorarium and Documentation)

XI. Documentation and Publicity

1.	Hording including eraction charges	Rs.5000
2.	Documendation	
a.	Preparation of Project report	Rs.3000
b.	Photo/Video	Rs.5000
c.	Leaflets/Phamplets/Booklets/Field Label	Rs.12000
d.	Orientation Campaings 100 Farmers/Batch Rs.2500/batch (5 batches x 2500= 12500)	Rs.12500
e.	Conduct of field days for 100 farmers/batch Rs.2500/batch (5 batches x 2500 = 12500)	Rs.12500
	Total	Rs. 50000

XIV. Capacity building for officers.

Imparting technical and managerial training to implementing officers in institute like MANAGE, NPPTI, etc @Rs.10000/officer Rs.10000

XV. Creation of Training Hall and Input Storage facilities.

1 No. for every 5000 Ha. Rs.10 lakhs.

XVI. Provision of Networking systems and staff on consolidated pay.

i. Purchase of computer with accessories

@ 1 No. per basin Rs.50000.

ii. Appointment of technical staff @Rs.6000/month

& clerical staff @ Rs.4000/pm Rs.1,20,000/year/block

XVII. Provision of conveyance for implementation and supervision

- 50 km average per visit Rs.50000/year



ANIMAL HUSBANDRY COMPONENT

IAMWARM PROJECT

MANIMUTHAR SUB BASIN

**Commissionerate of Animal Husbandry & Veterinary Services,
Chennai 600 006**

IAMWARM PROJECT

ANIMAL HUSBANDRY

1. INTRODUCTION

1.1 Our State being an agricultural based economy with more than 60% of the people engaged in animal husbandry, agriculture and allied activities, it forms the backbone of the rural economy. Animal husbandry contributes significantly in supplementing the income of small, marginal farmers and landless labourers many of whom are women who play a major role in the care and management of livestock. Livestock is not only an important source of income to the rural poor but also help s them sustain their livelihood in times of drought and famine. Livestock provide a diverse range of output varying from draught power and organic manure for agriculture, self employment throughout the year especially for women as well as direct production of milk, meat and eggs for human food.

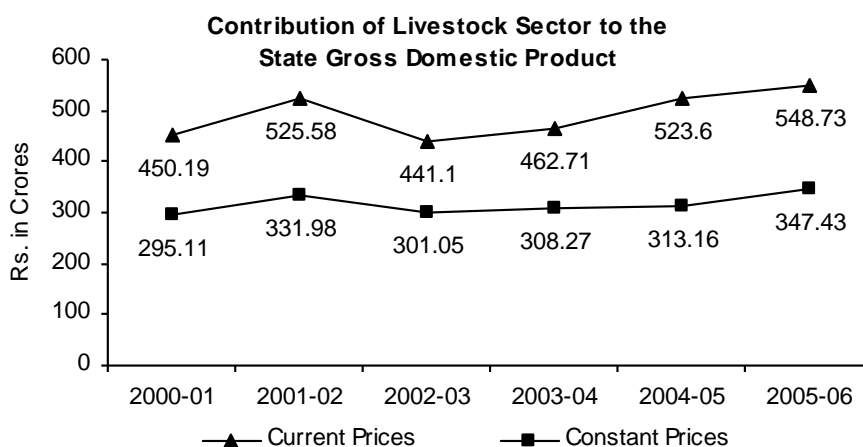
1.2 The contribution of livestock sector to the food basket in the form of milk, eggs and meat to the State has been impressive in fulfilling the animal protein requirement of ever growing human population. The estimated milk production which was 37.91 lakh MT during 1995 -96 has increased to 54.74 lakh MT during 2005-06. Similarly the egg production during the same period has increased from 3,048 million numbers to 6,223 million numbers. During the same period, the per capita availability of milk per day went up from 185 gms to 234 gms and eggs per annum from 54 numbers to 97 numbers respectively. The average growth rate of milk and egg during the last decade is 4.4% and 10.4% respectively. According to advance estimates (provisional), the contribution of livestock sector to the Gross State Domestic Product has increased from Rs.523.60 crores during 2004 -05 to Rs.548.73 crores during 2005-06, an increase of 4.8%.

Year	Current Prices (In crores)						Constant Prices (In crores)					
	Gross State Domestic Product	GSDP for Agriculture & Allied Activities	GSDP for Livestock Sector	%age Share of Agriculture & Allied Activities to GSDP	%age Share of Livestock Sector to GSDP	%age Share of Livestock Sector to Agriculture	Gross State Domestic Product	GSDP for Agriculture & Allied Activities	GSDP for Livestock Sector	%age Share of Agriculture & Allied Activities to GSDP	%age Share of Livestock Sector to GSDP	%age Share of Livestock Sector to Agriculture
2000-01	14109.98	2042.56	450.19	14.48	3.19	22.04	9101.07	1457.73	295.11	16.02	3.24	20.24
2001-02	14355.54	2056.09	525.58	14.32	3.66	25.56	8901.06	1457.22	331.98	16.37	3.73	22.78
2002-03	15509.93	1646.51	441.10	10.62	2.84	26.79	9170.32	1111.75	301.05	12.12	3.28	27.08
2003-04	16845.72	1700.21	462.71	10.09	2.75	27.21	9495.10	1081.96	308.27	11.39	3.25	28.49
2004-05	18892.11	2025.73	523.60	10.72	2.77	25.85	10324.84	1252.74	313.16	12.13	3.03	25.00
2005-06	20750.28	2097.25	548.73	10.11	2.64	26.16	11198.15	1305.98	347.43	11.66	3.10	26.60

2003-04 : Quick estimates

2004-05 : Advance estimates

2005-06 : Advance estimates(provisional)



1.3 Animal husbandry having a high potential for growth, its hidden potential needs to be explored as this can provide the much needed gainful employment opportunities to the weaker sections of the society and can contribute significantly in regeneration of the rural economy. Animal husbandry can ensure a better quality of life for the rural farmer by not only providing sustainable employment at their location itself but can also act as assets or rural currencies. Animal husbandry thus can act as a powerful instrument for the comprehensive socio-economic transformation of the rural people and can act as an engine for growth and trigger the economy by its multiplying effects.

2. PRESENT STATE SCENARIO

2.1 Tamil Nadu is home to 91.41 lakhs head of cattle, 16.58 lakhs buffaloes, 55.93 lakhs sheep, 81.77 lakhs goats besides 3.21 lakhs pigs and 865.91 lakhs poultry as per the 17th livestock and poultry census. The livestock ownership is more evenly distributed among landless labourers, small and marginal farmers and livestock production systems are based on low cost agro-by-products as nutritional inputs.

2.2 Veterinary assistance, health cover and breeding support to the livestock and poultry in the State is provided by 1,323 Government graduate veterinary institutions. The National Commission on Agriculture has suggested one veterinarian for every 5000 cattle units by the year 2000 A.D. whereas the present scenario is one veterinarian for every 10,000 cattle units. In addition 1,799 subcentres provide first aid and breeding support. Feed and fodder are the major limiting factors in enhancing farm animal productivity. But in the State a huge gap of around 47% exists between the requirement and availability of green fodder. Though farmers are well aware of the artificial insemination programme, their awareness level on best and latest animal husbandry practices, know-how on emerging new diseases and their control are not up to the expected level. Moreover with changing global scenario, the knowledge level of the veterinarians and para-veterinarians needs to be updated frequently to take the technology instantaneously to the end users - the farmers.

2.3 Though the State is endowed with large livestock population, the breedable age females covered through artificial insemination is only 30-35%. The conception rate under field conditions ranges from 35-40%. This is due to a mixture of various factors like low nutritional status, improper time of insemination and stress due to walking the animals for long distances to the institutions for artificial insemination, shortage of feed and fodder, prevalence of endemic livestock diseases. In the State, the per day average productivity of a non-descript and crossbred cattle is 2.73 kgs. and 6.27 kgs. respectively and that of a buffalo is 4.16 kgs. which is much below the expected yield. The productivity can be enhanced by adopting good management practices, feeding practices, bio security measures, effective disease prevention measures, etc.

3. SCENARIO IN THE MANIMUTHAR SUB BASIN

Livestock Population

Cattle	Buffalo	Sheep	Goat	Poultry
191775	313	69941	73516	21924

Breedable age Female Population

Crossbred Cattle	Non Descriptive cattle	Buffalo	Total
8564	68146	125	76835

Infrastructure and Man power in Government Veterinary Institutions

No. of Veterinary Institutions		Veterinary institutions filled up	
Graduate Institutions	Subcentres	Graduate Institutions	Subcentres
16	52	8	17

Average Per Day Milk Yield per animal

Crossbred Cattle	Non Descriptive cattle	Buffalo
6.1	2.9	4.6

Milk Procurement

Milk cooperative societies	Present milk procurement (LPD)	Milk Procured by Aavin (LPD)
20	7000	4000

4. Constraints, Challenges and Counter measures proposed:

S. No.	Constraints & Challenges	Countermeasures Proposed
1.	Remote villages and villages situated far away from the Government Veterinary Institutions are not getting sufficient veterinary services like veterinary health cover and artificial insemination facilities	The establishment of sub basin veterinary unit will ensure delivery of veterinary services at the farmer's door steps or nearest to the farmer's in remote villages and unserved villages of the sub basin area. Provision of veterinary health cover and artificial insemination are the main works at the farmer's door steps. The unemployed veterinary graduate will be given an entrepreneurship training to establish a Sub basin veterinary unit (details enclosed vide para 6.1 of page 6) in the sub basin area and disseminate best animal husbandry practices for his earnings and to upgrade animal husbandry practices of farmers in the sub basin area.
2.	Lack of upgraded infrastructure at the Government Institutions leading to constraints in delivery of quality veterinary services.	The Government Veterinary Institutions in the sub basin will be provided with additional essential equipments (details enclosed vide para 6.2.a. & 6.2.b. of page 10) to deliver quality veterinary services in the sub basin. In addition one veterinary dispensary (details enclosed vide para 6.2.c. of page 10) will be upgraded as referral institution for quick and accurate diagnosis of diseases and help in timely treatment thereby preventing economic loss to the farmers.
3.	There is a wide gap between the requirement and availability of green fodder needed for the livestock in the sub basin.	To reduce the gap between the requirement and availability of green fodder in the sub basin, it is proposed to cultivate CO3 fodder in 275 hectares of private lands, (details enclosed vide para 6.3.(d). of page 11) as a part of cropping plan.
4.	Main problem affecting the fertility in cross bred cattle is infertility leading to loss of milk production days, ultimately leading to loss to the farmers.	To overcome the infertility problems, infertility cum total health cover camps (details enclosed vide para 6.4.(b) of page 13) are proposed. The animals having infertility problems will be identified and treated. In addition, mineral mixture supplement (details enclosed vide para 6.4.(c) of page 14) will be given to rectify the defects.

S. No.	Constraints & Challenges	Countermeasures Proposed
5.	Lack of adequate know-how about the livestock management practices like feeding, breeding, health care and deworming activities.	The farmers in the sub basin will be given training (details enclosed vide para 6.5.a. of page 15) on best livestock management practices in livestock breeding activities like signs of oestrus, correct time of artificial insemination, deworming, feeding schedule and other health care measures. In addition, IEC materials will be distributed to farmers in the sub basin. More over hoardings and wall paintings depicting signs of commonly affecting diseases will be erected in places where people congregate in large numbers. Apart from this, quarterly night meetings will be conducted to disseminate information to the farmers in the sub basin. (details enclosed vide para 6.4.(d) of page 14)
6.	Lack of update knowledge and skills of the veterinarians and para-veterinarians in the project area.	Veterinarians in the project area will be given refresher training (details enclosed vide para 6.5.(d) of page 16) at Veterinary Colleges to update and refresh their skills and knowledge. They will inturn train the para-veterinarians.

5. OBJECTIVES OF THE PROJECT

5.1 With this background, the main objective of the Animal Husbandry Department will be to intervene in all possible ways utilising the resources to the maximum to improve the production potentialities of the livestock in the sub basin through multi disciplinary approach.

The main interventions will be:

- Productivity enhancement by improving delivery of veterinary services in the project area at the Government and private level.
- Increasing availability of green fodder and other fodder for sustenance.
- Conducting various out reach programmes to enhance productivity.
- Enhancing the knowledge level of human resource in the project area.

5.2 With the above interventions, not only the crossbred population in the sub basin is expected to rise but also the disease outbreaks will be kept under control. Moreover systematic and periodical deworming will lead to a 10% increase in weight gain, thereby increasing the total meat yield per animal. More over the various out reach programmes and enhancing the knowledge level in the sub basin area will lead to better animal husbandry practices. Thus ultimately, the per animal milk yield is expected to increase from 6.1 lts to 7 litres in crossbred, from 2.9 lts to 3.6 litres in indigenous and from 4.6 lts to 5.2 litres in buffaloes, leading to increased total farm income.

6. Productivity enhancement by improving delivery of veterinary services in the project area at the Government and private level.

6.1 *Establishment of Sub basin Veterinary Units.*

6.1.(a) Though there are 16 graduate veterinary institutions and 52 subcentres operating in the project area, there is still large livestock populations uncovered which is mainly due to the geographical terrain and distance these villages are located from the institutions. In this project, the main aim will be to provide effective veterinary cover and breeding support to these villages at their door steps by establishing Sub basin Veterinary Unit. The main criteria for establishing the unit will be livestock

population in the unserved area. Hence to provide effective services in these unserved areas, it is planned to establish 2 Sub basin Veterinary Units in the Project area.

6.1.(b) The details of Sub basin Veterinary Unit to be established, their coverage villages with distance and nearest Government Veterinary institution is furnished below.

Total number units in Manimuthar basin :			2	
Name of the Sub basin Veterinary Unit :			1. Sithanur	
Sl. No.	Name of Villages to be Covered	Distance from the sub basin Veterinary Unit (In Kms.)	Nearest Govt. Institution	Distance from the village to Govt. inst. (In Kms)
1.	Sithanur	-	VD, Devakottai	4
2.	Iravucheri	5	VD, Devakottai	5
3.	Uthayachi	6	VD, Devakottai	6
4.	Egarai	8	VD, Devakottai	6
5.	Ekarai Kottavayal	5	VD, Devakottai	7
6.	Nachankulam	6	VD, Devakottai	6
7.	Kottur	7	VD, Devakottai	5
8.	Pudukottai	6	VD, Devakottai	5
9.	Thachavayal	8	VD, Devakottai	7
10.	Manjani	6	VD, Devakottai	6
11.	Vasanthani	8	VD, Devakottai	7
12.	Maviduthikottai	6	VD, Devakottai	7
13.	Thirumanavayal	7	VD, Devakottai	9
14.	Panankulam	6	VD, Devakottai	8
15.	Thidakottai	7	VD, Devakottai	8

Villages 1 to 5	Mondays & Thursdays
Villages 6 to 10	Tuesdays & Fridays
Villages 11 to 15	Wednesdays & Saturdays
Sundays will be a reserve day in which IEC campaigns will be conducted. In addition if any villages are left out during the week, it will be covered on the reserve day.	

Sithanur village is about 4 kms from the nearest Veterinary institution namely Veterinary Dispensary, Devakottai. There are about 15 villages situated in and around Sithanur that are not covered by the Government Veterinary Institution. Further the breedable female population in and around Sithanur that is untapped by the Government veterinary institution is around 3500. Hence Sithanur village is fixed as the headquarters of the Sub basin Veterinary Unit.

Name of the Sub basin Veterinary Unit :			2. Senbaganur	
Sl. No.	Name of Villages to be Covered	Distance from the sub basin Veterinary Unit (In Kms)	Nearest Govt. Institution	Distance from the village to Govt. inst. (In Kms)
1.	Senbaganur	0	VD, Kallal	3
2.	Devapattu	5	VD, Kallal	10
3.	Kurunthampattu	5	VD, Kallal	5
4.	Alampattu	3	VD, Kallal	5
5.	Keelapoongudi	4	VD, Kallal	5
6.	Vepankulam	5	VD, Kallal	5
7.	Vetriyoor	7	VD, Kallal	5
8.	A. Siruvayal	7	VD, Kallal	6

9.	Thiruthipatti	4	VD, Kallal	5
10.	Panangudi	9	VD, Kallal	8
11.	Aalavilampatti	7	VD, Kallal	8
12.	Sevarakottai	14	VD, Kallal	12
13	Vaarivayal	6	VD, Devakottai	8
14	Kallupatti	9	VD, Devakottai	11
15	SR.Pattinam	13	VD, Devakottai	7

Villages 1 to 5	Mondays & Thursdays
Villages 6 to 10	Tuesdays & Fridays
Villages 11 to 15	Wednesdays & Saturdays
Sundays will be a reserve day in which IEC campaigns will be conducted. In addition if any villages are left out during the week, it will be covered on the reserve day.	

Senbaganur village is about 3 kms from the nearest Veterinary institution namely Veterinary Dispensary, Kallal. There are about 15 villages situated in and around Senbaganur that are not covered by the Government Veterinary Institution. Further the breedable female population in and around Senbaganur that is untapped by the Government veterinary institution is around 50 00. Hence Senbaganur village is fixed as the headquarters of the Sub basin Veterinary Unit.

6.1.(c) An unemployed Veterinary Graduate who will be designated as Sub basin Veterinary Extension Officer will man each Unit. He will be given one month entrepreneurship training at renowned national institutions like IRMA / NDDB. On completion of this training, the Animal Husbandry Department will give him 5 days orientation training in the nearest veterinary institution. The orientation training will be an overview of the departmental organisation and structure, duties and role of officers, disease endemicity and farmers know-how in the area.

6.1.(d) On completion of training, the unemployed veterinary graduate selected will be given a two wheeler. The two wheeler vehicle will be the property of the Water Users Association. He will be located in the Water Users Association building, which will be his headquarters. He will prepare a weekly route map in consultation with Animal Husbandry Department, Water Users Association and local village panchayats for providing veterinary services. He will visit the villages as per the scheduled programme and provide veterinary services like vaccination, deworming, castration and treatment and breeding support like artificial insemination and pregnancy diagnosis. The route will be reviewed and assessed for intake of the veterinary services by the end users once in 3 months and suitable alterations if necessary will be made. Flexibility will be given to change the tour programme based on need. The unit will be under the technical control of the Animal Husbandry Department. The sub basin veterinary extension officer will computerize all records regarding artificial insemination like date of artificial insemination done, straw used, sire yield, date of follow up for conception, etc.

6.1.(e) To provide breeding support by artificial insemination necessary inputs like LN2 containers (a 35 lit. and 3 lit.), artificial insemination guns, thawing flasks and straw cutters (one set) will be provided. The funds for the above inputs (LN2 containers, artificial insemination guns, thawing flasks and straw cutters) will be sourced from Tamilnadu Livestock Development Agency (TNLDA). The unit will also be provided with other equipments like microscope, centrifuge, etc. for carrying out preliminary disease diagnosis. Other inputs for breeding like LN2 and frozen semen straws will also be provided for carrying out services at the farmers door step. The unit will also be provided with dewormers, essential surgical items like cotton gauge, catguts, intra-uterine infusions, etc., which will be procured from Tamilnadu Medical Services Corporation (TNMSC) for providing veterinary services. In addition a one time revolving fund of Rs.10,000/- will be provided to the Water Users Association. The above fund will be utilised for stocking of medicines and injectables as per the requirement of the Sub basin Veterinary extension officer. The fund for the above will be sourced from the project. The Animal Husbandry Department will ensure supply of vaccines like Hemorrhagic septicemia, Black quarter, Anthrax, Enterotoxaemia and Sheep pox free of cost for carrying out vaccination in the unit's service area. The Regional Joint Director of Animal Husbandry will be the facilitator for purchase of the above items from TNMSC and will also ensure prompt supply of vaccines.

6.1.(f) The veterinarian will be allowed to collect fees for the artificial insemination and he will remit Rs.25/- per insemination to the Water Users Association and keep the remaining for himself as service charges. In addition, he can collect a nominal fee of Rs.50/- for minor treatments and Rs.100/- for major treatments as professional charges for himself. The cost of medicines utilised for treatment will be borne by the farmer. However if the farmer prefers, the sub basin veterinary extension officer can utilise the medicines and injectables available with the Water Users Association and collect additional charges for medicines utilised which will be remitted to the Water Users Association. The above amount remitted will be used as revolving fund for purchase of medicines. To ensure a wider coverage with increased conception rate, a performance linked incentive for every calf born out of inseminations done by the Unit will be factored, wherein a sum of Rs.25/- will be given during first year and there after a decrease of Rs.5/- per year. The amount remitted by the unit to the Water Users Association will be kept as seed money for sourcing inputs for sustainably running the unit after withdrawal of funds by the lending agency for the project.

6.1.(g) Each unit will be established at a total cost of Rs.5.73 lakhs for 5 years in which Rs.0.99 lakhs will be non-recurring and Rs.4.74 lakhs will be recurring cost. Totally 2 units will be established in the river basin at a total cost of Rs.11.45 lakhs. The financial details and number of units to be established in each river basin is furnished below

**FINANCIAL COST FOR ESTABLISHMENT OF ONE SUB BASIN VETERINARY UNIT
(In Rs.)**

NON-RECURRING EXPENDITURE/UNIT		1st yr. Rs.					
1	Cost of one 35 lts and 3 lts LN2 container Rs.18,000/- (will be sourced from TNLDA)	0					
2	Cost of A.I. Gun, thawing flask and straw cutter Rs.1000/- (will be sourced from TNLDA)	0					
3	Purchase of two wheeler and accessories	50000					
4	Cost of other equipments like centrifuge, castrator, etc.	14000					
5	Binocular Microscope	15000					
6	Purchase of furniture, etc	10000					
7	One time revolving fund for purchase of medicines	10000					
	Total	99000					
RECURRING EXPENDITURE/UNIT		I Year	II Year	III Year	IV Year	V Year	Total cost (In Rs.)
1	Cost of straws @ Rs.15/straw at the rate of 2400/1st yr, 2700/2nd yr, 3000/3rd yr, 3360/4th yr & 3840/5th yr.	36000	40500	45000	50400	57600	229500
2	LN2 @ 250 Lit/year @ Rs.26/lit for I year and there after an increase of Rs.1/- per year	6500	6750	7000	7250	7500	35000
3	Cost of basic medicines, infusions and surgical items @ Rs.20,000/annum	20000	20000	20000	20000	20000	100000

4	Incentive for the veterinarian for each calf born @ Rs.25/- yr and there after an decrease of Rs.5/- per year	4000	19600	16500	12240	6880	59220
5	Miscellaneous Charges for chemicals, glasswares, etc.	10000	10000	10000	10000	10000	50000
	Total	76500	96850	98500	99890	101980	473720
	Recurring Expenditure for 5 years						473720
	Total (Recurring + Non-recurring)						572720

6.1.(g) The above endeavor will ensure that areas hitherto unserved are covered qualitatively by increased breeding cover via artificial insemination coverage, health cover by timely vaccination, deworming and treatment. This will ensure proper disease control and livestock with better genetic potentialities which will lead to increased productivity per animal thereby ultimately leading to better profits between farmers in the project area.

6.2 Improving the essential infrastructure in the Government institutions in the project area.

6.2. (a).1 Graduate Institutions: A good and well-equipped infrastructure is the key to an all round growth and development. There are 16 graduate veterinary institutions and 52 subcentres functioning under the Government fold in the project area. The infrastructure in the graduate veterinary institutions are being strengthened at a cost of Rs.33,000/- per Graduate Institution. The infrastructure that are to be added in each Graduate Institution are Mouth Gag, dentist autoclave, mastitis detector, etc. The 16 institutions will be strengthened at a cost of Rs.5.28 Lakhs.

6.2.(a).2 Mouth gag will help in better diagnosis, dentist autoclave will be handy which can be carried to field for sterilization of equipments, instruments used in routine Veterinary practice while mastitis detector will be useful for detection of sub clinical and clinical mastitis – a disease that causes reduction in milk yield, loss of productive days and prolonged recovery time. The animal does not achieve the peak productivity after mastitis, the early detection of which will prevent economic loss to the farmers. All these measures will help in effective delivery of veterinary services and early diagnosis and facilitate quality and timely treatment of ailments for the livestock in the sub basin area.

6.2.(b) Sub-centres: The infrastructure presently available to subcentres was provided 30 years back are old and needs replacement. It is proposed to provide essential equipments like castrators (large and small), dressing tray, scissors, forceps, wash basin, etc. to each sub centre in the project area at a cost of Rs.20,000/- per sub centre. Totally 52 subcentres in the project area will be provided with essential equipments at a total cost of Rs.10.4 lakhs.

6.2.(c) Strengthening Diagnostic Facilities in Sub-basin Referral Institution: Strengthening the diagnostic facilities in the sub basin by providing special diagnostic tools to one sub basin veterinary institution at a cost of Rs.3.00 lakhs, is also a part of the project. The institution will be designated as Referral Institution for the sub basin. The Veterinary Dispensary at Devakottai will be upgraded as the referral institution for the sub basin. In the identified referral institution, semi auto analyzer and accessories will be provided for ensuring complete timely blood analysis.

6.2.(d) Infrastructure improvement in the project area will enhance the quality of delivery in veterinary services and diagnostic facilities contributing to reduction in the incidences of animal diseases, thereby increasing the overall productivity, which can contribute significantly in increasing the farm income of the farmers.

6.3. Increasing availability of green fodder .

6.3.(a) Feed and fodder are the major limiting factors in enhancing farm animal productivity. In our country, fodder production is still deemed ancillary to agricultural production. The green fodder

resources for livestock are mainly derived from grazing in grasslands and pastures, fodder crops from cropped lands, weeds, bund grasses, tree leaves and mixed forages. Crop residues mainly sorghum and paddy straws which are poor in nutritive value constitute the major fodder for livestock. The economic viability of livestock husbandry depends on sources of feed and fodder, as feeding cost constitutes 65-70% of the total cost of livestock farming. The availability of green fodder is restricted to selected areas and seasons. Green fodder should be fed throughout the year not only to maintain milk production but also for improving the conception rate. Moreover adequate availability of green fodder will reduce the dependence of farmers on concentrates.

6.3.(b) Generally small ruminants like sheep and goats are not stall-fed. They are allowed for grazing. Hence for calculation of green fodder, only the bovines are taken into account. In the project area a considerable gap exists between requirement and availability of green fodder.

6.3.(c) The requirement, availability and shortage of green fodder for the bovine population in the project area is furnished below.

	Sub basin	Bovine Population	Requirement (In MT)	Availability (In MT)	Shortage (In MT)	%age of Shortage
1	Manimuthar	192088	594200	57500	536700	90%

Hence to reduce the green fodder shortage, around 440 hectares of additional land will to be brought under fodder cultivation in the sub basin area.

6.3.(d) Around 400 hectares of land earmarked for fodder cultivation in the private lands in the project area will be taken up for cultivation of Co3 and kolukattai grass. In addition, 40 hectares of land available in District Livestock Farm, Chettinad will be taken up for cultivation of Co3. The farmers will be supplied inputs like seeds and slips. The cost of cultivation will be borne by the farmer. The Animal Husbandry Department will ensure supply of quality seeds and slips. The yield rate and cost of inputs is furnished below.

Sl. No.	Name of fodder	Avg. Yield per year (In tonnes)	Cost of inputs Per Hectare (In Rs.)
1.	Co3	300	6,000
2.	Kolukattai	40	3,000

Village Panchayat wise fodder cultivation area proposed (In Hac.)

1.	Devakottai	20
2.	Aravayal	20
3.	Puliyal	20
4.	Thiruvegampath	20
5.	Periyakarai	20
6.	Elavankottai	20
7.	Sarugani	20
8.	Kannangudi	20
9.	Siruvachi	20
10.	Kallal	20
11.	Anumanthagudi	20
12.	Kundrakudi	20

13.	Kallupatti	20
14.	Thirukostiyur	20
15.	Velangudi	20
16.	Kandanur	20
17.	Singampunari	20
18.	Muraiyur	20
19.	Piranmalai	20
20.	Eriyur	20
	Total	400

6.3.(e) The new area to be brought under fodder cultivation and the status of green fodder in the sub basin after implementation of the project is as follows.

Present Fodder Status :

Fodder maize @ yield rate of 50 MT/ha for 150 ha (In MT)	Co3 @ yield rate of 250 MT/ha for 200 ha (In MT)	Total availability (IN MT)
7500	50000	57500

Fodder Availability Status after the end of project:

Year	Yield to be added (In MT)					Cost of inputs		
	Co3 fodder @ yield rate of 250 tonnes/ha for 100ha @ 10 ha for 1st yr, 40 ha for 2nd & 3rd yr and 10ha for 4th yr	Kolukattai grass @ yield rate of 40 tonnes/ha for 300 ha @ 50 ha for 1st yr, 100 ha for 2nd & 3rd yr, 30 ha for 4th yr and 20 ha for 5th yr.	Total Proposed Yield to be added	Total fodder available during the end of the year	shortage of fodder (In MT)	Co3 fodder @ Rs.6000 /ha	Kolu-kattai grass @ Rs.3000 /ha	Total Cost (In Rs.)
I Year	2500	2000	4500	62000	532200	60000	150000	210000
II Year	10000	4000	14000	76000	518200	240000	300000	540000
III Year	10000	4000	14000	90000	504200	240000	300000	540000
IV Year	2500	1200	3700	93700	500500	60000	90000	150000
V Year	0	800	800	94500	499700	0	60000	60000

In addition, 40 hectares of unutilised land available in the District Livestock Farm, Chettinad will be brought under the cultivation of Co3 fodder. The financial details are given below :

S. No.	Particulars	First Year	Second year (16 ha)	Third Year (16 ha)	Fourth year (8 ha)	Fifth Year
1.	Cleaning of heavy jungle as per Public Works Department schedule of rate III A (i) 20% (200 m ²) Rs.1.90/3800/- x 40 ha. ii) Deep Ploughing with disc as per forest rate C-12 Rs.1180/ha x 40 ha	1,99,200				
2.	Protection of barbed wire fencing for 40 ha Rs.25,000/acre	25,00,000				
3.	Erection of borewell with irrigation arrangements motor pump set accessories @ 1 borewell per 8 ha.		6,00,000	6,00,000	3,00,000	
4.	Cost of cultivation of fodder including Agricultural inputs Rs.10,000/ac x 8 ha		4,00,000	4,00,000	2,00,000	
5.	Recurring Cost of Cultivated fodder Rs.12,000/ha.			1,92,000	3,84,000	4,70,000
	TOTAL	26,99,200	10,00,000	11,92,000	8,84,000	4,70,000
	NET TOTAL	Rs.62,45,200				

As the area is bushy it has to be cleared for fodder cultivation for which disc ploughing is to be carried out. Barbed wire fencing is essential to protect the fodder cultivated against theft by public and animal grazing. Fodder cultivated at Chettinad Farm will be sold to the farmers in the Manimuthar sub basin at the cost of Rs.0.50 / kg.

6.3.(f) By the above cropping pattern in the sub basin, the green fodder availability will be increased from 57500 MT to 104500 MT. In addition 7500 MT of green fodder will be available after the harvest of maize. So, totally 112000 MT of green fodder will be available in the sub basin at the end of the project. Ultimately the shortage will be 482200 MT. The above shortage will be met by allowing the animals to graze in the tank bunds, Common Property Resources, etc.

6.4 Improving the knowledge level of the farmers by various out reach programmes.

6.4.(a) The success of the project depends on effective dissemination of information to the field in improving the knowledge level of the farmers on best and latest animal husbandry practices, emerging new diseases and their control and optimum utilisation of fodder resources by various out reach programmes.

The out reach programmes planned in the project area are:

1. Infertility cum Total Veterinary Health Care camps.
2. Distribution of mineral mixture
3. Information, education and communications campaigns.

6.4.(b) Infertility cum Total Veterinary Health Care camps.

6.4.(b).1. Under this programme, infertility cum total health cover both preventive and curative will be provided to all livestock and poultry by conducting special camps in each sub-basin Veterinary Unit service area at the rate of one camp per unit per month for 5 years. In these camps, various activities like health care, disease prevention vaccination against endemic diseases, deworming, castration, artificial insemination, pregnancy verification, infertility treatment, etc. will be carried out free of cost. An exhibition depicting various livestock diseases and preventive measures, fodder development measures, calf rally along with demonstration will also be conducted for creating awareness among the farmers.

6.4.(b).2. Prior wide publicity will be given regarding the village where the camp is to be conducted in the village and near by villages. In addition, the day and place where the camp is to be conducted will be displayed in the Water Users Association building. The services of the veterinarians and para-veterinarians working in the Animal Husbandry Department in the sub basin area will be utilised for conducting the camps. A calf rally will be organised in the camp and best calf / calves will be given prizes which will act as motivation for other farmers. During the camps, pamphlets and leaflets on best and latest animal husbandry practices, emerging new diseases and their control and optimum utilisation of fodder will be distributed.

6.4.(b).3. Each camp will be conducted at a cost of Rs.6,000/-.

Sl. No.	Component	Cost in Rs.
1.	Medicines	3,500
2.	Cost of 50 straws for artificial insemination	750
3.	Publicity and Propaganda	500
4.	Distribution of prizes in calf rally	500
5.	Miscellaneous charges like erection of shamina, etc., for conducting the camp	750
	Total	6,000

6.4.(b).4. Apart from total health cover the camp is expected to achieve, it will help in identifying animals affected by infertility due to mineral deficiency. The total financial cost for this component for 5 years is Rs.7.20/- lakhs.

6.4.(c). Distribution of mineral mixture.

6.4.(c).1. One of the major problems affecting conception is infertility. The major causative factor for infertility in the field is mineral deficiency. Hence to correct this deficiency, which is the vital factor affecting conception and calving, it is proposed to distribute mineral mixtures to needy animals in the project area.

6.4.(c).2. The sub basin veterinary extension officer visiting the villages on the scheduled programme will select the eligible animals during the visit. In addition animals will also be identified during the infertility cum total health cover camps. The eligible animals will be given mineral mixture @ 25 gms per day for 365 days. The sub basin veterinary extension officer will maintain the data of eligible animals covered under this programme and ensure examining the animals regularly for growth parameters. The sub basin wise cost required for distribution of 25 gms. of mineral mixture for 365 days to 100 animals at a cost of Rs.40/- kg per sub basin veterinary extension officer for 5 years is 1.825 lakhs. For 2 units, 3.65 lakhs would be required for this component.

6.4.(c).3. By this the animals will come to estrum early and lead to better conception and calving rates. Moreover this will lead to reduction in inter-calving period there by increasing the productive life of the animal.

6.4.(d). Information, education and communications campaigns

6.4.(d).1. Printing of Pamphlets and leaflets.

Pamphlets and leaflets on best practices in animal husbandry, biosecurity measures to be taken to prevent diseases, economic diseases affecting livestock and their prevention and control measures, optimum utilisation of fodder resources with emphasis on inclusion level of non conventional feeds, etc. will be printed in Tamil for distribution to the farmers in the project area.

6.4.(d).2. Erection of hoardings and wall paintings in the project area.

Posters, hoardings and banners carrying the activities undertaken in the project area will be displayed in all Sub basin Veterinary Units. The same will also be displayed in all Government institutions functioning in the project area. In addition wall paintings depicting signs of commonly affecting diseases will be painted on walls where people congregate in large numbers

6.4.(d).3. Conducting Night meetings

6.4.(d).1.a. Night meetings will be conducted involving the Water Users Association, Animal Husbandry Department and Sub basin veterinary Extension Officer at a common place in the sub basin on a suitable day in each Sub basin Veterinary Unit and Graduate institution area at the rate of one per quarter. The meeting not only enables participation of all the farmers in the sub basin but also acts as a source of information to other farmers.

6.4.(d).1.b. During the night meetings, village people will be enlightened on benefits of rearing livestock and will be motivated to take up livestock rearing. Pamphlets and leaflets will be distributed to the farmers. A small exhibition and method demonstration will be organised for the benefit of the farmers. The services of link agencies like Tamilnadu Veterinary and Animal Sciences University and Tamilnadu Milk Producers Cooperatives Union will be utilised where ever necessary. In the night meetings successful animal husbandry entrepreneurs in the village and neighboring villages will be requested to share their views on their methodology followed for their success.

6.4.(d).4. All the above Information, education and communications campaigns will be conducted in the sub basin at a total cost of Rs.6.60 lakhs.

6.5. Enhancing the knowledge level of human resource in the project area.

Continuing education is the touchstone of success. The project envisages capacity building at all levels like farmer, veterinarian, para-veterinarian operating in the sub basin to achieve the desired results of increased sustainable productivity at the end of the project.

6.5.(a). Training of Farmers

6.5.(a).1. Farmers generally have a traditional knowledge of breeding and management of livestock. The existing awareness, knowledge level and skill in profitable rearing of livestock with latest animal husbandry techniques among majority of farmers are minimum in the project area. Hence it is essential to impart training to upgrade the skills and knowledge level for profitable animal husbandry rearing.

6.5.(a).2. Under this programme, elite farmers interested in animal husbandry activities will be selected and given training on best practices in livestock rearing. They will also be enlightened on importance of feeding and cultivation of fodder crops. Emphasis will be given to enlighten the farmers on feeding of unconventional feeds and their inclusion level. Moreover they will be briefed about the diseases generally affecting the livestock in the basin and their symptoms and control measures. In addition they will be enlightened on the importance of deworming, vaccination and clean milk production. The farmers trained will be utilised for dissemination of the above information to their counterparts in the villages.

6.5.(a).3. For the above purpose, progressive farmers @ 400 per year interested in animal husbandry activities in the sub basin will be selected for 3 day training. They will be divided into batches of 25 per

batch. Training will be provided in the nearest veterinary institution. They will be given a training incentive of Rs.100/day as they will have to attend the training programme foregoing their normal daily earning. During the training, each trainee will be given study material worth Rs.50/- . To motivate the trainer, a trainer honorarium of Rs.250/- per day will be provided. In addition miscellaneous charges of Rs.500/- will be provided for each batch. A total cost of Rs.10,000/- will be required for training each batch. During the project period of 5 years, a total of 2000 farmers (80 batches of 25 farmers per batch) in the sub basin will be trained at a cost of Rs.8.00 lakhs.

6.5.(b). *Entrepreneurship Training to unemployed Veterinary Graduates :*

3 Unemployed Veterinary Graduates are to be trained for the Kottakaraiyar Sub basin. 2 River basin veterinary units are proposed in the sub basin area. One unemployed Veterinary graduate is trained additionally for the future in case there is any drop out. The entrepreneurship training is given to the unemployed veterinary graduate for sustainable animal husbandry activities.

6.5.(c). *Orientation Training for Rural Veterinary Extension Officers*

6.5.(c).1. Though the sub basin veterinary extension officers are basically veterinarians who may possess a sound theoretical knowledge on animal husbandry and veterinary treatment, their field experiences and exposure may be minimum. To attain the desired field results in a short term, it is essential to know the terrain and problems faced by the farmers in the basin. Hence 5 days orientation training is proposed for the sub basin veterinary extension officer selected to work in the Sub basin Veterinary Unit.

6.5.(c).2. Training will be provided to each Sub basin Veterinary Extension Officer in the nearest veterinary institution in the sub basin which will be identified by the Regional Joint Director and Assistant Director of Animal Husbandry of the concerned jurisdiction. They will be given a training incentive of Rs.150/day. During the training, each will be given study material worth Rs.100/-. To motivate the trainer, a trainer honorarium of Rs.500/- will be provided. A total cost of Rs.1,350/- will be required for training each Sub basin Veterinary Extension Officer. Thus in the project area to train 2 Sub basin Veterinary Extension Officers, Rs.2700/- would be required.

6.5.(d). *In-service Training for 16 Veterinarians*

6.5.(d).1. Veterinarians have an overall knowledge of breeding, management, diagnosis and treatment of livestock. With advancing science and technology, the techniques followed may have become obsolete. Moreover, new and simple techniques have evolved in animal husbandry management, breeding, diagnosis and treatment. Hence it is essential to update the knowledge and skills of the veterinarians in Government institutions in the project area.

6.5.(d).2. The 16 veterinarians working in the Government institutions in the sub -basin will be given a trainers training at Madras Veterinary College / Namakkal Veterinary College at a cost of Rs.2000/- per individual. The total cost for training the 16 veterinarians in the sub -basin would be Rs.32000/-

7. Ensuring marketing tie up for the products.

With the rapid urbanisation, changing life styles and increasing purchasing power of the people, the demand for livestock and livestock products is expected to rise steadily. Hence marketing the livestock and livestock products in the sub basin will not be a major problem.

MANIMUTHAR SUB BASIN

The breedable age female population in the Manim uthar Sub Basin is 76835 which include 8564 crossbred, 68146 indigenous cattle and 125 buffaloes.

ASSUMPTIONS:

- 1) Available breedable female population in the basin after reducing for mortality, sterility etc., at the rate of 15% in crossbred, 5 % in indigenous and 5 % in buffaloes, there will be 7279 crossbred, 64739 indigenous and 119 buffaloes.
- 2) At present there are 16 Graduate Veterinary Institutions and 52 Sub centres functioning under Government fold doing artificial insemination work of which 8 Graduate Veterinary Institutions and 35 subcentres are vacant.
- 3) The above Government Institutions have carried out an average artificial insemination of 2730 in crossbred, 6370 in indigenous and 40 in buffaloes.
- 4) Assuming 2.8 (35%) inseminations are required for consumption in cattle and 3.3 (30%) inseminations are required for conception in buffaloes, the actual animals covered is 975 crossbred, 2275 indigenous and 12 buffaloes.
- 5) Thus the breedable age female population unserved by the Government institutions is 6304 crossbred, 62464 indigenous and 107 buffaloes.
- 6) For of the above animals unserved, two sub basin veterinary units will be established in the sub basin each covering around 30 villages.
- 7) During the first year 2,400, second year 2,700, third year 3,000, 4th year 3,360, 5th year 3,840 and from then on 3,840 artificial inseminations will be done by each sub basin veterinary unit.
- 8) It is assumed that 35% crossbred (1680), 60% indigenous (2880) and 5% (240) buffaloes will be targeted by the above two units during the first year.

Yearwise Number of animals targeted

Year	AI done by the unit (45% crossbred,50% Indigenous,5% buffalo)		
	Crossbred	Indigenous	Buffalo
I Year	1680	2880	240
II Year	1890	3240	270
III Year	2100	3600	300
IV Year	2352	4032	336
V Year	2688	4608	384

- 9) The conception rate for the Sub basin veterinary unit is as follows:

Year	Conception Rate in Cow	Conception Rate in Buffalo
1st year	35% (2.8)	30% (3.3)
2nd year	40% (2.5)	35% (2.8)
3rd year	45% (2.2)	40% (2.5)
4th year	50% (2.0)	45% (2.2)
5th year	50% (2.0)	50% (2.0)

- 10) Taking a conception rate of 35% for cattle and 30% for buffalo during the first year, the actual animals covered by the unit will be 600 crossbred, 1029 indigenous and 145 buffaloes.

Year	Yearwise Number of animals covered		
	Crossbred	Indigenous	Buffalo
I Year	600	1029	73
II Year	756	1296	96
III Year	955	1636	120
IV Year	1176	2016	153
V Year	1344	2304	192

- 11) By the work done by these two units during the first year, out of the total 1629 cattle (600 crossbred 1029 indigenous) conceived, 50% (815) heifer calves will be born. Similarly out of 73 buffaloes, 36 buffalo heifer calves will be born.

Year	Yearwise Number of heifer calves born	
	Crossbred	Buffalo
I Year	815	37
II Year	1026	48
III Year	1296	60
IV Year	1596	77
V Year	1824	96

- 12) Now calf mortality is taken as 5% for crossbred and 10% for buffaloes. Therefore out of the 815 crossbred heifer calves, 41 will be lost. Similarly out of 37 buffalo calves, 4 will be lost during the first year.

Year	Yearwise Number of heifer calves lost	
	Crossbred	Buffalo
I Year	41	4
II Year	51	5
III Year	65	6
IV Year	80	8
V Year	91	10

- 13) The actual crossbred animal in milk created in the sub basin by intervention by these units during first year will be 1629 (600 Crossbred plus 1029 Indigenous cattle). Similarly 73 buffaloes will be in the milk.

Year	Yearwise Number of animals in milk		
	Crossbred	Indigenous	Buffalo
I Year	600	1029	73
II Year	756	1296	96
III Year	955	1636	120
IV Year	1176	2016	153
V Year	1344	2304	192

- 14) The average milk yield in the project area will be increased to 7 litres in crossbred, 3.6 litres in indigenous and 5.2 litres for buffaloes.
- 15) During the first year, the total milk yield in the sub basin by intervention by these units will be 14. 11 lakh litres by crossbred (assuming 6.1 lts. is the average yield), 6.96 lakh litres (assuming 2.9 lts. is the average yield) by indigenous and 1.00 lakh litres (assuming 4.6 lts. is the average yield) by buffalo.

Year	Average Milk Yield/day (In Lts.)			Total Milk Yield/ lactation (In lakh Lts.)		
	Crossbred	Indigenous	Buffalo	Crossbred (300 days lactation)	Indigenous (280 days lactation)	Buffalo (300 days lactation)
I Year	6.1	2.9	4.6	10.98	8.36	1.01
II Year	6.3	3.1	4.8	14.29	11.25	1.38
III Year	6.5	3.3	5.0	18.62	15.12	1.80
IV Year	6.7	3.5	5.1	23.64	19.76	2.34
V Year	7.0	3.6	5.2	28.22	23.22	2.99

- 16) Thus the value of milk in the sub basin will be Rs.184 lakhs during the first year (cost of cow milk is Rs.9/- and buffalo milk is Rs.10/-).

Year	Value of Milk (In lakh Rs.)			
	Crossbred	Indigenous	Buffalo	Total
I Year	99	75	10	184
II Year	129	101	14	244
III Year	168	136	18	322
IV Year	213	178	23	414
V Year	254	209	30	493

- 17) Thus economic return at the end of the project by way of milk will be Rs.493lakhs , an increase of Rs.309 lakhs.
- 18) The cattle heifer calves born during the first year is brought into breeding stock during the 3rd year. Similarly in buffalo 1st year heifer calves is brought into 4th year breeding stock.

Year	Yearwise Female Breeding stock created		
	Crossbred	Indigenous	Buffalo
I Year	6304	62464	107
II Year	6304	62464	107
III Year	7078	62464	107
IV Year	8053	62464	140
V Year	9284	62464	183

19) The main advantages of the programme

- ☞ Provides service at the farmer's doorstep or nearest to the farmer's doorstep.
- ☞ Increased coverage
- ☞ Better conception rate
- ☞ Reduced stress to the animals
- ☞ Timely treatment
- ☞ Reduced recovery time from illness
- ☞ Ensuring coverage of animals with vaccination and deworming
- ☞ Saving the man hours of the farmers
- ☞ Genetic potential improvement (crossbred)
- ☞ Timely artificial insemination, thereby not only increasing conception and calving rate, but also reducing the inter-calving period.
- ☞ Timely artificial insemination and calving, leads to more production days during the productive life cycle of the animal.
- ☞ Reducing scrub bulls born out of natural service.
- ☞ Avoiding diseases like Trichomonosis, brucellosis, etc., affecting the uro-genital tract of females, leading to abortion, sterility, etc., when the animals are put into natural service.
- ☞ For natural service, the chance of the same bull serving the mother and dam is higher which may lead to inbreeding, but if frozen semen is used, the semen can be rotated nullifying the chances of inbreeding.
- ☞ Increasing the per animal milk production potential, leading to a substantial increase in milk production
- ☞ Increasing the farmers income through animal husbandry.

OUTCOMES EXPECTED

Sl. No.	Project Year	I Year	II Year	III Year	IV Year	V Year	Total
1	Artificial Insemination Done (In Nos.)	4800	5400	6000	6720	7680	30600
2	Calves Born (In Nos.)	1704	2148	2712	3346	3840	13750
3	Heifer calves born (In Nos.)	852	1074	1356	1673	1920	6875
4	Milk Yield (In lakh Lts.)	20.35	26.92	35.54	45.74	54.44	182.99
5	Value of Milk (In Lakh Rs.)	184	244	322	414	493	1657

Note: Out of the total value of milk 70 - 75% will be the cost of inputs like feed, fodder, healthcare etc.,

**ESTIMATE FOR ANIMAL HUSBANDRY COMPONENT TO BE INCLUDED IN IAMWARM
PROJECT REPORT
MANIMUTHAR SUB BASIN**

	Components	Physical	Financial (In Lakhs)
1	Productivity enhancement by improving delivery of veterinary services		
	<i>a. Establishment of Sub basin Veterinary Units (SBVU) @ Rs.5,72,720/- per unit</i>	2	11.45
	<i>b. Improving the essential infrastructure in the Government institutions (graduate institutions) @ Rs.33,000/-unit</i>	16	5.28
	<i>c. Improving the essential infrastructure in the Government institutions(subcentres) @ Rs.20,000/-unit</i>	52	10.40
	<i>d. Strengthening the diagnostic facilities in the sub basin by providing special diagnostic tools to sub basin referral institutions @ Rs.3,00,000/- per unit</i>	1	3.00
2	Increasing availability of green fodder a) In private land: 1. Kolukattai grass - 300 hacs. 2. Co3 - 100 hacs. b) In Government land: 1. Co3 - 40 hacs.		77.45
3	Out reach programmes.		
	<i>a. Infertility cum Total Veterinary Health Care camps @ Rs.6,000 per camp per month for each SBVU</i>	120	7.20
	<i>b. Distribution of mineral mixture @ Rs.1,82,500 per SBVU</i>	2	3.65
	<i>c. Information, education and communications campaigns</i>	18	9.90
4	Enhancing the knowledge level of human resource		
	<i>a. Training of Farmers</i>	2000	8.00
	<i>b. Enterpruneship training to 31 unemployed veterinary graduates to be placed as Sub basin Veterinary Extension Officer @ Rs.50,000/- per person</i>	3	1.50
	<i>b. Orientation Training for Sub basin Veterinary Extension Officers @ Rs.1,350/- trainee</i>	2	0.03
	<i>c. In-service Training for Veterinarians @ Rs.2,000/- per person</i>	16	0.32
			138.18

Tamil Nadu Agricultural University



Irrigated Agriculture Modernization and Water Resource Management

IAM WARM

Sub basin Plan – Manimuthar

TNAU COMPONENT



**Nodal Officer (IAMWARM)
Director
Water Technology Centre
TNAU, Coimbatore-3**

Irrigated Agriculture Modernization and Water Resource Management (IAMWARM)
TNAU component –Manimuthar Sub Basin

a. About The Institute

- Agricultural College and Research Institute, Madurai (AC & RI) is a constituent college of Tamil Nadu Agricultural University, Coimbatore. The Agricultural College and Research Institute was started at Madurai in 1965 to provide agricultural education to aspirants in southern districts of Tamil Nadu
- The college is situated at twelve kilometers away from the Madurai City on Madurai -Trichy National Highway. The college is the second biggest campus of TNAU with an area of 154.14 hectares.
- Agricultural College and Research Institute, Madurai was adjudged as the best College among Tamil Nadu Agricultural University for the year 2002.
- The major strength of this institute are viz.,
 - ✓ Released 5 Paddy varieties - among that MDU 5 is famous in the dry tracts of southern Tamil Nadu.
 - ✓ One KVK is exclusively functioning for catering the farmers of southern Tamil Nadu.
 - ✓ One Home science college is offering courses and trainings for value addition and women empowerment.
 - ✓ All India coordinated water management project is functioning for the past 30 years and is undertaking exclusive water management and OFTs in farmers field..
 - ✓ Excellent Laboratories in different disciplines of Agriculture

b. About the sub basin:

Area

Fully irrigated	– 5, 802 ha
Partially irrigated	– 7, 851 ha
Gap	– 3, 268 ha
Total area	-16, 921 ha

Climate

The Climatological features are tabulated below:

- **The annual average rainfall is 818 mm.**

S.No.	Average climatological factors	S.W Monsoon	N.E Monsoon	Winter	Summer
1.	Monthly Temperature in °C	30.8	26.7	26.5	31.2
2.	Relative Humidity in %	72.5	80.3	78.2	73.3
3.	Wind Speed in Kmph	9.8	4.5	4.1	5.2
4.	Sun Shine hrs/day	6.0	5.6	8.8	8.6

Soil Type

S. No.	Taluk	Soil type	Major soil series
1.	Devakottai	Sandy clay	Milaganur, Hanumanthakudi, Tiruppuvanam, Surakudi, Kallal, Kondadevi, Nerupugapatti
2.	Tiruppathur	Clay loam	Kallal, Pattamangalam, Piranmalai, Singampunari, Surakudi

Cropping Pattern

Sl.No	Name of the crop	Season	WITHOUT PROJÉT				WITH PROJECT			
			FI	PI	RF	Total	FI	PI	RF	Total
I	ANNUAL									
1.	Sugarcane		425	0	0	425	530	0	0	530
2.	Fodder – Co3		0	100	0	100	200	0	0	200
	Total		425	100	0	525	730	0	0	730
II	PERENNIAL									
1.	Coconut		250	0	0	250	300	0	0	300
2.	Mango		0	68	0	68	93	0	0	93
3.	Sapota		0	14	0	14	34	0	0	34
4.	Amla		0	38	0	38	58	100	0	158
	Total		250	120	0	370	485	100	0	585
III	Ist Season									
1.	Paddy	Sep-Jan	5127	6453	1578	13158	12268	0	0	12268
2.	Maize	Sep-Oct	0	0	0	0	0	150	0	150
3.	Brinjal	Jul-Oct	0	96	0	96	116	0	0	116
4.	Bhendi-hybrid	Jul-Oct	0	184	0	184	324	0	0	324
5.	Chillies	Oct-Feb	0	868	0	868	1018	0	0	1018
6.	Watermelon	Dec-Feb	0	30	0	30	0	40	0	40
7.	P.Juliflora	-	0	0	1690	1690	0	0	0	1690
	Total		5127	7631	3268	16026	13726	190	0	15606
	Grand total		5802	7851	3268	16921	14941	290	0	16921
IV	II nd Season									
1.	Pulses	Jan-Apr	0	475	0	475	150	650	0	800
2.	Groundnut	Jan-Apr	0	800	0	800	0	1400	0	1400
3.	Hybrid Bhendi	Jan-Apr	0	0	0	0	75	0	0	75
4.	Hybrid Brinjal	Jan-Apr	0	0	0	0	55	0	0	55
5.	Gingelly	Dec-Apr	0	175	0	175	0	275	0	275
	Total		0	1450	0	1450	280	2325	0	2605
	Grand Total		5802	9301	3268	18371	15221	2615	0	19526
	Cropping Intensity	%				89				115

c. Objectives

- ◆ To promote water saving technologies (SRI / Drip) in agriculture and horticultural crops for large scale adoption
- ◆ To enhance crop and water productivity
- ◆ To increase the cropped area by diversification
- ◆ To converge with WRO and other line departments in over all improvement in total farm income

d. Issues

- Less area in maize
- Non adoption of SRI in paddy
- Non adoption of drip fertigation for sugarcane
- Low yield in groundnut

e. Counter measures proposed

- ❖ Improved crop production technologies for maize
- ❖ SRI
- ❖ Drip fertigation in Sugarcane
- ❖ Improved production technologies in Groundnut

PROJECT MODE ACTIVITIES

Technologies for transformation

a. Improved crop production technologies for Maize

Objective:

Popularising improved crop production technologies with maize hybrid Co H -4

Technology

Maize is an alternate crop for the areas in which the water scarcity is a common problem. Since the farmers cultivating private hybrids with higher seed cost, there is a need to introduce TNAU hybrids in this sub basin

Special features of CO-H(M) 4

Minimum water requirement (650 mm)

Shorter duration (95-100 days)

Higher yield @ 6.25 t/ha

Suited for both irrigated and rainfed

Justification

Maize is introduced in Manimuttar under diversification in an area of 1000 ha. To popularize and familiarize the technologies TNAU introduces demonstration for 50 ha.

Linkage

The water Resource Organization will rehabilitate the tanks and increase the water availability in the tanks. The gap area will be brought under irrigation with low water requirement crop maize.

Sl. No.	Technology	Area, Ha	Unit cost	Budget Rs. in Lakhs	Location
I.	Improved production technologies in Maize	50	Rs. 6000/ ha	3.00	Attached in Activity chart
	Field days for 3 years		Rs.10000/year	0.30	

Justification for the unit cost

Sl.No	Particulars		Amount in (Rs.)
1	Hybrid Seed cost with seed treating chemicals (20k g/ha) @ Rs. 80 /kg	:	1800.00
2	Cost of fertilizers (150:75:75 kg NPK / ha)	:	
	Urea - 330 kg @ Rs. 5 / kg	:	1650.00
	Super Phosphate - 469kg @ Rs. 4 /kg	:	1875.00
	Muriate of Potash - 83 kg @ Rs.4.75/ kg	:	625.00
	Cost of Bio fertilizer	:	
	Azospirillum and Phospho bacteria @ 10 pockets each	:	120.00
	Total cost		6070.00

b. Improved crop production technologies for Groundnut

Objective –

Popularizing the improved technologies like adoption of seed drill, groundnut stripper in Groundnut

Justification and Linkage

Micro irrigation is provided for 500 ha of groundnut by Agricultural engineering department. Demonstrating the usefulness of the machineries like seed drill and stripper in these areas will result in the cumulative effect on the yield. Based on that TNAU introduces demonstration of 100 ha in which 3

seed drills and 3 ground nut strippers will be purchased and handed over to 3 associations in Kotti Anicut Edathupura Vaikkal WUA, Meyyapatti -Nedumaram Kanmoi WUA and Veepankulam Mela Kanmoi WUA.

Sl. No.	Technology	Area (ha)	Unit cost	Budget Rs.(lakhs)	Location
II	Improved production technologies in Groundnut	100	Rs. 6500/ha	6.50	Attached in Activity chart
	Tractor drawn seed drill- 3 Nos - Groundnut stripper-3 Nos			1.20	Thiruppathur Kanmoi
	Field days for 3 years		Rs.10000/year	0.30	-

Justification for the unit cost

Sl.No	Particulars	Amount in (Rs.)
1	Seed cost with seed treating chemicals (125kg/ha) @ Rs. 40 /kg	: 5000.00
2	Soil application of Trichoderma viride 2.50 kg @ Rs. 150 /kg	: 375.00
	Gypsum application @ 400 kg/ha @ Rs. 1.50 /kg	600.0
3	Micronutrient spray	
	(DAP - 2.5 kg, Ammonium sulphate – 1 kg, Borax – 500g and Planofix – 375 ml) @ Rs. 200/ spray for 3 sprays	600.00
	Total cost	6575.00

c. Model village concept

Name of the tank: Thiruppathur Kanmoi

Crop/Technology	Area Proposed	To cover	Budget Rs. in lakhs
Supply of quality seed			
Rice – ADT 39	50 ha	3000 ha	0.30
Groundnut – VRI 2	20 ha	200 ha	1.00
Demonstration of technology			
Organic Farming & IFS model in Rice	1 ha	-	1.00

Soil Testing

Soil testing to issue soil health card for 1000 farmers - 0.5 lakhs

d. On farm demonstration and skill development

Details	Duration (Days)	No/Batch	Total Batch	Budget /Batch	Total (Lakh)
SRI techniques	1	50	5	20000	1.0
New improved cultivation techniques for groundnut	1	50	2	20000	0.4
New improved cultivation techniques for Maize	1	50	2	20000	0.4
Soil sampling techniques	1	50	2	20000	0.4
Drip irrigation and fertigation	1	50	2	20000	0.4

Farm mechanization in groundnut cultivation	1	50	2	20000	0.4
Training to labours on SRI transplanting	1	100	5	10000	0.5
Total					3.50

Venue: Agricultural College and Research Institute, Madurai and KVK Madurai
Budget for Project Mode

S. No	Activities	Amount (Rs. in Lakhs)
1	a. Technology transformation	11.30
	b. Model village	2.30
	c. Soil Testing	0.50
2.	On Farm Demonstration and skill devt.	3.50

II. MISSION MODE ACTIVITIES

Transformation technologies for large scale adoption

a System of Rice Intensification

Objectives

1. To minimize the usage of water
2. To improve the productivity of rice and enriching the soil
3. To obtain higher net return

Technology

Scientific management technique of allocating irrigation water based on soil and climatic condition to achieve maximum crop production per unit of water applied over a unit area in unit time is very much essential under present condition. System Rice Intensification (SRI) is one among the scientific management tool. Under conventional system of rice cultivation the rice yield will be low due to poor weed management increases competition among crop and weeds, Poor aeration affects the root activity and tiller production and Poor water management increases the water requirement. SRI does not require the purchase of new seeds or the use of new high -yielding varieties and SRI dose require skillful management of the factors of production and at least initially, additional labor input – between 25 and 50% particularly for careful transplanting and for weeding. Square planting ensures Rotary weeder operation in either direction. Rotary weeder operation incorporates the weed biomass and aerates the soil for better root activity and tillering. Efficient water management reduces the irrigation water requirement.

As farmers gain skill and confidence in SRI methods, labor input decreases and can eventually become the same or even less compared with conventional rice -growing methods.

The SRI technique has the following features

- ❖ Young and robust seedling (14-15 days)
- ❖ One seedling per hill
- ❖ Square planting under wider spacing (22.5 x 22.5 cm)
- ❖ Rotary weeding up to 40 days at 7-10 days interval.
- ❖ Irrigation after the disappearance of ponded water
- ❖ “N” management through Leaf Colour Chart

SRI technique has the following advantages

- Saving of seed material 50-65 kg /ha.
- Saving of 300-400 mm of irrigation water
- Saving of 12-16 women laborers in weeding
- Saving of 15-45 kg N/ha. by following LCC method of N management

Rotary weeder has the following advantages

- ✓ Improves soil structure
- ✓ Increases soil aeration,
- ✓ Enrichment of O₂ near the root zone,
- ✓ Increases the microbes population,
- ✓ Better nutrient availability and uptake by the plants,
- ✓ More tillering ability

Justification and Linkage

Adoption of SRI in rice system reduces the water requirement with an yield increase of 15 -20%.

In this Manimuttar sub basin area under rice will be reduced by 4000 ha in first season. To offset the production loss introduction of SRI will be the best option for maintaining overall production. TNAU introduce a demonstration of 300 ha which helps in large scale adoption.

Convergence

- The technologies resulted in the complementary effect of the water augmentation and micro irrigation methods
- Adoption of technologies resulted in over all standard of living of basin farmers
-

S.No	Particulars	Budget (Rs. in lakh)
Budget For Mission Mode III - SRI in Rice(300 ha)		
1	Cost of critical inputs seeds and nutrients @ 10000/ha	30.0
	Total	30.0

Justification for the unit cost

Sl.No	Particulars	Amount in (Rs.)
1	Seed cost with seed treating chemicals (8kg/ha) @ Rs. 25 /kg	: 200.00
2	Raising nursery (wooden frame, rosecan, polythene sheet)	: 1000.00
3	Square transplanting cost @ 50 B/ha @ Rs.80/l abour (Labour cost should be borne by the farmers)	: 4000.00
4	Rotary weeder 5 No. Rs.500/no for square planting	: 2500.00
5	Cost of row marker for planting (One no.)	: 1000.00
6	Cost of fertilizers (150:50:50 kg NPK / ha)	:
	Urea - 330 kg @ Rs. 5 / kg	: 1650.00
	Super Phosphate - 312.5kg @ Rs. 4 /kg	: 1250.00
	Muriate of Potash - 83 kg @ Rs.4.75/ kg	: 415.00
	ZnSO ₄ 25 kg @ Rs. 25 / kg	: 625.00
	Cost of Bio fertilizer	: 120.00
	Azospirillum and Phospho bacteria @ 10 pockets each	:
7.	Cost of Plant protection chemicals	:
	Pseudomononas 2.5 kg / ha @ Rs. 75 /kg	200.00
	Monocrotophos 1.5 litre/ha @ Rs. 300 /litre	450.00
	Quinylphos 2 litres / ha @ Rs. 250 / litre	500.00
	Mancozeb 2 kg/ha @ 250 / kg	500.00
	Total	14,410.00

b. Mission mode on Sugarcane fertigation

The productivity of water is the inter-dependent relationship between the amount of water used and the economic yield realised, which is also termed as Water Use Efficiency (WUE) at different levels. The productivity of water could be increased in field level either by reducing the water requirement without detrimental effect on yield or by increasing the production per unit water by controlling loss of water through conveyance, distribution, application, seepage, percolation *etc.*, Micro irrigation techniques like drip irrigation in sugarcane improves the Water Use Efficiency

Technology

Pit diameter – 3 feet
 Depth – 1 1/4 feet
 Distance – 5 feet
 Lateral spacing – 3 m
 Micro tube with on line drippers 8 lph

Justification and Linkage

Totally 600 ha of sugarcane will be covered in post project period. The department of Agricultural Engineering providing drip 325 ha. Under mission mode TNAU covers 105 ha under drip fertigation. Water saving 30 %

BUDGET for Mission mode

S.No	Particulars	Project cost (50 % of drip cost)	Budget (Rs. in lakh)
Budget For Mission Mode I- Sugarcane fertigation (100 ha)			
1	Cost of drip fertigation system	29.00	58.00
2	Cost of nutrients @ 5500/ha		5.80
	Sub Total A		63.80

Justification for the unit cost

Sl.No	Particulars		Amount in (Rs.)
1	Drip system	:	58000.00
2	Fertigation		
	Urea 598 kg @ Rs. 5 /kg	:	3000.00
	Super Phosphate - 400 kg @ Rs. 4 /kg		1600.00
	Muriate of Potash – 187.4 kg @ Rs.4.75/ kg	:	890.00
			5490.00
	Total		63490.00

III. Expected output

Activity	Demonstration Area (Ha)	Area spread for adoption (Ha)	Additional productivity (kg/ha)	Additional production (in tonnes)	Additional revenue (Rs. in lakhs)	Water saving million (m ³)
Improved production technologies in maize	50	1000	1000	100	100	-
Improved production technologies in groundnut	100	1000	697	697	139.40	-
System Rice Intensification in rice	300	1500	1100	1650	82.50	6.00
Drip fertigation in sugarcane	100	300	20 tonnes/ha	6000	60.00	4.20

IV. ACTIVITY CHART

Year	Project mode		Mission mode	
	Maize	Groundnut	Sugarcane drip fertigation	SRI in Paddy
I	-	46 ha	20 ha	115 ha
II	20 ha	35 ha	30 ha	100 ha
III	20 ha	19 ha	40 ha	85 ha
IV	10 ha	-	10ha	--
V	Adoption and monitoring			
Total	50 ha	100 ha	100 ha	300 ha

Finance (Rs. In Lakhs)

Sl. No	Particulars	I	II	III	IV	V	Total
I	Activities						
1	a.Improved production technologies Maize	1.20	1.20	0.60	-	-	3.00
	b. Field days	0.10	0.10	0.10	-	-	0.30
2.	a.Improved production technologies in groundnut	2.990	2.275	1.235	-	-	6.50
	b. Field days	0.100	0.100	0.100			0.30
3	Seed production Rice	0.06	0.15	0.09	-	-	0.30
	Groundnut	0.30	0.60	0.10			1.00
5	Organic farming and IFS in rice	1.00	-	-	-	-	1.00
6	Soil testing	0.50	-	-	-	-	0.50
7	OFD and skill devt	3.50	-	-	-	-	3.50
9	SRI in rice	11.50	10.0	8.50	-	-	30.00
10	Sugarcane fertigation	12.70	19.05	25.40	6.35	-	63.80
II	Out Sourcing	7.20	7.20	7.20	3.60	3.60	28.80
III	Contingencies	2.00	1.50	1.00	1.00	1.00	6.50
IV	Equipments	3.00	-	-	-	-	3.00

TOTAL BUDGET FOR MANIMUTHAR

Sl.No	Particulars	Physical	Financial (in lakhs)
I	Activities		
1	Improved production technology for Groundnut + 3 field days	100 ha	6.80
	Groundnut seed drill and stripper	Each 3 Nos.	1.20
2	Improved production technology for Maize + 3 field days	50 ha	3.30
3	Quality seed production Groundnut and Rice	70 ha	1.30
4	Demonstration of organic farming and IFS modal in Model villages	1 No	1.00
5	SRI	300 ha	30.00
6	Sugarcane drip fertigation	100 ha	63.80
7	OFD and skill development	-	3.50
8	Soil testing	-	0.50

		<i>Sub Total</i>	112.20
II	Out Sourcing for technical assistance		
1	6 nos for first 3 years, 3 nos for 4 th and 5 th year	9000 Salary + 1000 FTA per Month	28.80
		<i>Sub Total</i>	28.80
III	Contingencies		
	a. Vehicle hire charge for Scientists @ Rs.60000/yr		3.00
	b. Documentation and Reporting		1.00
	c. Chemicals, stationeries etc.,		2.50
		<i>Sub Total</i>	6.50
IV	Equipments		3.00
	Computer, Printer, Scanner, LCD, Copier		
		<i>Sub Total</i>	3.00
		Total	150.50
	Incentive 1% of the total cost		1.51
	Total		152.01
	Institutional charges @ 7.5 %		11.40
	Grand Total		163.41

Impact

- ❖ **Crop:** Rice
- ❖ **Technology:** SRI
- ❖ **Area under demonstration:** 300 ha
- ❖ **Area under adoption :** 1500 ha

- ❖ **Crop:** Groundnut
- ❖ **Technology:** Improved production technologies in groundnut
- ❖ **Area under demonstration:** 100 ha
- ❖ **Area under adoption :** 1000 ha

- ❖ **Crop:** Maize
- ❖ **Technology:** Improved production technologies in maize
- ❖ **Area under demonstration:** 50 ha
- ❖ **Area under adoption :** 150 ha

- ❖ **Crop:** Sugarcane
- ❖ **Technology:** Drip fertigation
- ❖ **Area under demonstration:** 100 ha
- ❖ **Area under adoption :** 300 ha

**Nodal Officer – IAMWARM
and Director (WTC)
TNAU, Coimbatore.**

Annexure
Activity chart

Project mode 1. Improved production technologies in Maize

	Name of the tank	Area (Ha)	I st year	II nd year	III rd year	IV th year
1	Pandi Kanmoi	15	5	5	5	
2	Sembanur Tank	10	5	5	-	
3	Kalkulam Tank	10	5	5	-	
4	Kurunthangudi Tank	15	5	5	5	
	Total	50	20	20	10	

Project mode 2. Improved production technologies in Groundnut

	Name of the tank	Area (Ha)	I st year	II nd year	III rd year	IV th year
1	Nedumaram Kanmoi	10	5	5	-	
2	Soorakkudi Tank	10	5	3	2	
3	Thiruppathur Kanmoi	20	10	5	5	
4	Athani Tank	20	5	5	10	
5	Velyathur Tank	10	5	3	2	
6	Eriyur Kanmoi	10	5	5	-	
7	Ekarairottavayal Tank	10	5	5	-	
8	Mangalakudi Tank	5	3	2	-	
9	Mahibalanpaty Kanmoi	5	3	2	-	
	Total	100	46	35	19	

Activity Chart

Mission mode 1. System of Rice Intensification

	Name of the tank	Area (Ha)	I st year	II nd year	III rd year	IV th year
1	Thiruppathur Kanmoi	20	5	9	6	-
2	Nedumaram Kanmoi	15	5	5	5	-
3	Athani Tank	10	3	4	3	-
4	Avanthi Tank	15	5	5	5	-
5	Perumaruthur Tank	10	4	4	2	-
6	Karaiyur Kanmoi	10	3	4	3	-
7	Kottairuppu Kanmoi	15	5	5	5	-
8	Sunnampiruppu Kanmoi	15	10	3	3	-
9	Eriyur Kanmoi	10	5	3	2	-
10	Anjukottai Tank	10	5	2	3	-
11	Kappalur Tank	15	5	5	5	-
12	Sirukambiyur Tank	15	5	5	5	-
13	Oriyur Kanmoi	10	3	2	5	-
14	Murai Kanmoi	15	5	5	5	-
15	Sithamalli Kanmoi	10	5	3	3	-
16	Eluvani Kanmoi	15	5	5	5	-
17	Bhiramanattai Kanmoi	15	8	4	3	-
18	Enathi Kanmoi	10	4	3	3	-
19	Keela Kanmoi	15	5	6	4	-
20	Parani Kanmoi	15	6	6	3	-
21	Kambani Tank	15	6	5	3	-
22	Poyyalur Tank	10	4	4	2	-
23	Dhemmapattu Kanmoi	10	4	3	2	-
	Total	300	115	100	85	-

Mission mode1. Sugarcane Fertigation

	Name of the tank	Area (Ha)	Ist year	IInd year	IIIrd year	IVth year
1	Mahibalanpatty Kanmoi	10	-	5	5	-
2	Matti Kanmoi	5	-	-	-	5
3	Enathi Kanmoi	10	5	-	5	-
4	Eriyur Kanmoi	10	5	-	5	-
5	Eluvankottai Tank	10	-	-	5	5
6	Ekaraikottavayal Tank	10	5	5		
7	Karumangudi Tank	10	-	5	5	-
8	Hanumanthkudi chinna Kanmoi	10	-	5	5	-
9	Thidakkottai Tank	10	5	-	5	-
10	Mangalakudi Tank	5	-	5		
11	Sirukambiyur Tank	5	-	5		
12	Nerkuppai Tank	10	-		5	5
	Total	105	20	30	40	15



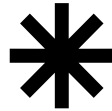
HORTICULTURE DEPARTMENT

***WORLD BANK ASSISTED
MULTI DISCIPLINARY PROJECTS***



IAMWARM

MANIMUTHAR SUB BASIN



HORTICULTURE PROJECT PROPOSALS

**WORLD BANK MULTI DISCIPLINARY IRRIGATED AGRICULTURE
MODERNIZATION AND WATER RESOURCES MANAGEMENT PROJECT
IAM – WARM
SUB – BASIN – MANI MUTHAR HORTICULTURE**

DISTRICT: Madurai, Sivagangai, Ramanadapuram

I. Existing Horticulture Crop Scenario

The following horticulture crops are grown in the sub basin.

Block covered - Sanarpatti, Natham, Alanganaloor, S.Pudur, Ponnamaravathy, Thirupattur, Kallal, Kalaiyarkovil, Devakottai, Kannangudi, Thiruvadanaai.

Taluk covered – Natham, Meloor, Thirupattur, Devakottai, Thiruvadanaai.

S.No.	Crop	Season	Varieties	Area (in Ha)	Production (in M.T)/ha	Productivity/ton/ha
	a. Fruit crops:					
1.	Mango	Perennial	Nelam, Bangaloor	68	272	4
2.	Sapota	Perennial	PKM 1, PKM 2	34	850	25
3.	Aonla	Perennial	BSR 7, Kanchan	38	532	14
	b. Vegetable crops:					
1.	Bhendi	July - October	Arka, Anamika	184	1288	7
2.	Brinjal	July – October	Local	96	1056	11
3.	Watermelon	December – Feb	-	30	240	8
4.	Chillies	Oct – Feb	Mundu	868	434	0.500
	II nd crop					
1.	Hybrid Bhendi	Jan – Apri	Myco 10	0	0	0
2.	Hybrid Brinjal	Jan – Apri	Ravaya	0	0	0

II. Existing Horticulture Practices:

1. Inputs:

a. Seed:

Present seed materials used are certified seeds, High yielding varieties and farmers local seeds which gives low yield.

Seeds are available from the private source and government institution. Regarding planting materials plans available from government farm, Horticulture research station and private sources. Required quality seeds are available from private and government sources.

b. Soil:

In Manimuthar basin soil is red, black soil, Alluvial. Soil is tested by soil testing laboratory available at Sivagangai, once in 3 years interval only. Few farmers are practicing the STL recommendation. Soil test lab available in Sivagangai and Mobile Soil Testing lab at Paramakudi. The climate is mainly tropical in nature with a cooler period between December to January. Maximum average temperature is 20 to 48° c

c. Prevalence of Organic farming:

Only few farmers are practicing Organic farming in Fruit and Vegetable crops. Organic farmers association is practicing Organic farming.

1) Block covered - Sanarpatti, Natham, Alanganaloor, S.Pudur, Ponnamaravathy, Thirupattur, Kallal, Kalaiyarkovil, Devakottai, Kannangudi, Thiruvadana.

Existing cropping pattern and Season:

- 1. Vegetables - June to September - Adipattam
- 2. Fruits - Throughout the year

d. INM & IPM – crop wise area:

No of farmers adopting INM & IPM is nil.

e. Actual extension service available for TOT – Govt. / Private:

Available extension officers	-	Horticulture Officer, Devakottai.	-	1 No
		Horticulture Officer, Natham	-	1 No
		Horticulture Officer, Karaikudi	-	1 No
		Assistant Agriculture Officer	-	20 No's

Available extension officers to provide extension service to the farmers which are inadequate.

Apart from this NGO's are providing extension service to the farmers.

Name of the NGO's:

Place

- | | |
|---------------------------------|-------------|
| 1) TRUPA | Thirupattur |
| 2) WORLD VISION | Karaikudi |
| 3) KASTHURI BAI MAHALIR MANTRAM | Devakottai. |

Need for more extension personnels.

2. Practices – Ground realities:

a. Irrigation:

Irrigation is by open well and borewell. Mostly farmers are using direct channel and furrow irrigation. Only 10% of the farmers are using drip irrigation. Open well and borewell irrigation is practiced which is inadequate. Farmers practice rainfed cultivation. Ground water is available in plenty. There is a lot of Scope for developing fruit crops by using drip irrigation.

b. Micro irrigation:

Drip and sprinkler irrigation are proposed during the current year.

c. Fertigation:

Farmers follow applying fertilizers directly. Fertigation practice is to be taken up along with implementation of micro irrigation system.

d. Contract farming:

Contract farming is not practiced in the command area.

e. Pre & Post harvest practices adopted:

Harvested produce is sold by the farmers directly at the production centre itself. Crops like chilly alone is sundried and marketed.

f. Labour issues:

Availability of labour is fair.

3. Agri – processing – Factories, Capacity, etc.

There is no practice for processing fruits and vegetables. Produce is disposed through daily market, ulavar santhai, weekly market, near by town madurai. Weekly market in Karaikudi, Devakottai, Melur, Dindigul.

III. Constraints:

1. Constraints in Existing scenario:

a. Problem soil:

- 1) Needs reclamation
- 2) Lack of nutrients
- 3) Micro Nutrient deficiency
- 4) Less humus content
- 5) Poor water holding capacity

b. Adverse climatic condition:

These blocks are drought prone. Rainfall is scattered. Rainfall is received during northeast monsoon which is very poor. Generally no cultivation is practiced through out the year. Prevalence of drought is noticed in 5 blocks.

c. Inferior quality of seed and planting material:

Farmers are using local and poor quality seeds. True seeds are used by meagre no of farmers. Quality seeds are supplied by the department. There are two farms available at Devakottai and Nemam, Rediyarchathiram.

d. Limited Seed planting material available from Govt. sources:

Required quantity of planting materials are not available. Seeds are supplied to the farmers by tender system.

e. Improper varieties:

Farmers are using local and poor quality seeds. Quality seeds supplied by the department is not adequate. Farmers are not practicing cultivation through out the year. Certified seeds are used by farmers in some areas.

f. Inadequate extension service:

Available extension officers	-	Horticulture Officer, Devakottai.	-	1 No
		Horticulture Officer, Natham	-	1 No
		Horticulture Officer, Karaikudi	-	1 No
		Assistant Agriculture Officer	-	20 No's

Available extension officers to provide extension service to the farmers is inadequate. Apart from this NGO's are providing extension service to the farmers. there is need for more extension officers in the command area.

<u>Name of the NGO's:</u>	<u>Place</u>
1) TRUPA	Thirupattur
2) WORLD VISION	Karaikudi
3) KASTHURI BAI MAHALIR MANTRAM	Devakottai.

Need for more extension personnels are required.

Area covered: 1813 Ha.	Staff available: 10 Nos.	Balance staff needed 10 Nos
---------------------------	-----------------------------	--------------------------------

g. Low price for produce:

Farmers are cultivating vegetable crops in a particular season (Adi pattam). Getting poor price at the time of harvest. Middleman are taking the major portion of the profit of the farmers.

h. Poor adoption of Pre & Post harvest technologies:

Farmers are not following pre and post harvest technologies. This needs more attention. No market facilities. Poor market facilities.

1. Uncertainty of market for Horticultural produces
2. Lack of assured market tie-up or buy back arrangements for the flowers & Pr oducts.

i. Limited availability of Credit facilities:

Presently farmers are facing problem in getting the loans from the banks. This need to be taken in to consideration for helping the farmers.

j. Risk aversion & k. Limited processing units:

Nil.

IV. Diversification / Future vision proposed:

S. No.	Components	Variety	Unit cost	Assistance 75%	25% share/ farmers	Physical target (in ha)			Total (in ha)
						I year	II year	III year	
I.	AREA EXPANSION								
	A) FRUIT PLANTS								
	1. Mango	Alphonsa, Himayudeen	30000	22500	7500	5	10	10	25
	2. Sapota	PKM3, PKM4	30000	22500	7500	5	10	5	20
	3. Amla	NA7, Kanchan	30000	22500	7500	40	40	40	120
2.	VEGETABLE CROP								
	1. Hybrid bhendi	Mahyco 10	30000	22500	7500	40	50	50	140
	2. Watermelon	Namthari	30000	22500	7500	5	5	0	10
	3. Hybrid Chillies	Priyanga, Vaishnavi	30000	22500	7500	50	50	50	150
	4. Hybrid Brinjal	Ravaiyah, Mohini	30000	22500	7500	25	25	25	75

V. Challenges thrown up by diversification / area expansion:

1. Judicious utilization of water.
2. Identification of suitable crops / varieties.
3. Production of quality / quantity planting materials.
4. Farmers acceptability for new crops
5. Awareness campaigns to the farmers
6. Publicity and propaganda to be taken up for crop diversification.

VI. Solutions and Recommendations:

1. Soil reclamation:

- i) Soil reclamation will be made as per the recommendations STL.
- ii) Mulching, addition of organic manure.

2. TIP (Technical Input Provider) – Agri clinic:

- i) Extension service should be provided to the farmers at 100 ha / TIP.
- ii) By employing TIP the problem of low price can be solved by advising farmers.

3. Staggered Planting:

Farmers can be advised delayed and late planting varieties by training them.

4. Mulching, Micro – irrigation:

Efficient water usage by adoption of micro irrigation and mulching.

5. Identification of crops & varieties suitable for drought.

The area is drought prone. Identification of crop like Mango, Amla, Sappota, chillies, Bhendi, Brinjal and watermelon are recommended.

6. Consultative process undertaken in the sub basin:

The walk through survey was conducted on Aug 20st and 23rd at Puliyaal and Chembanur villages respectively. Discussion were held with farmers and their requirement was heard. Then after discussion among the officers the decision was taken up.

7. Stakeholders demands (List)

- i) Instead of local variety farmers demanded hybrid variety of vegetables and quality planting materials.
- ii) Demand for micro irrigation.
- iii) Latest technology transfer – production technology and post harvest technology.
- iv) Inputs for organic farming

- v) Training and visit for gaining experience from other state horticultural technology.
- vi) Credit facilities.
- vii) Processing unit for preserving vegetables and fruits.
- viii) Need technical advise,
- ix) Need market information centre.

8. Marketing intervention proposed with reference to identified constraints:

S.No.	Crop	Constraint & Challenges	Counter Measures
1.	Fruit & Vegetable	Problem soil – Soil is deficient of major and micro nutrients. Humus content is low. Water hold capacity is low. Some soils are alkaline patch.	Soil has to be improved by adopting organic cultivation. Soil reclamation has to be taken up.
2.	“	Use of poor quality seeds & Planting materials	Improved variety of seeds and planting materials to be supplied by the department / Private.
3.	“	Poor technology adopted	Latest and New technology to be provided and training should be given by TNAU scientist.
4.	“	Poor awareness of horticulture crops among the farmers	Awareness campaigns to be conducted periodically about the pre and post harvest technology
5.	“	Poor marketing facilities	Growers association and water user association farmers to be assisted in marketing their produces and Installation of Micro irrigation system.
6.	“	Organic Farming method not followed.	Adoption of organic farming method by the farmers will be improved by giving training.
7.	“	Technically Pest Management not followed by the farmers.	Introduction and adoption of integrated pest and diseases management by giving training.

MANIMUTHAR BASIN

Registered Ayacut 16921
 Partially Irrigated area 7851
 Fully Irrigated 5802
 Gap 3268

Sl.No	Crop	Season	Without Project				With Project				Increase
			FI	PI	Gap	Total	FI	PI	Gap	Total	
Perennial											
1	Mango	Perennial	0	68	0	68	93	0	0	93	25.00
2	Sapota	Perennial	0	14	0	14	34	0	0	34	20.00
3	Amla	Perennial	0	38	0	38	158	0	0	158	120.00
Ist Crop											
1	Hybrid Chillies	Oct – Feb	0	868	0	868	1018	0	0	1018	150.00
2	Hybrid Bhendi	July – Oct	0	184	0	184	324	0	0	324	140.00
3	Hybrid Brinjal	July – Oct	0	96	0	96	116	0	0	116	20.00
4	Hybrid Watermelon	Dec - Feb	0	30	0	30	40	0	0	40	10.00
IInd Crop											
1	Hybrid Bhendi	Jan – Apri	0	0	0	0	75	0	0	75	75.00
2	Hybrid Brinjal	Jan - Apri	0	0	0	0	55	0	0	55	55.00
	Total			12980		1298	1913			1913	615.00

MANIMUTHAR BASIN											
MANIMUTHAR BASIN – PHYSICAL & FINANCIAL TARGET											
S.No	Crop	Unit cost	Assistance 75%	1st Year		IInd year		IIIrd year		Total	
				Phy	Fin	Phy	Fin	Phy	Fin	Phy	Fin
1.	Mango	30000	22500	5	1.50	10	3.00	10	3.00	25	7.50
2.	Sapota	30000	22500	5	1.50	10	3.00	5	1.50	20	6.00
3.	Aonla	30000	22500	40	12.00	40	12.00	40	12.00	120	36.00
4.	Hybrid Chillies	30000	22500	50	15.00	50	15.00	50	15.00	150	45.00
5.	Hybrid Bhendi	30000	22500	65	19.50	75	22.50	75	22.50	215	64.50
6.	Hybrid Brinjal	30000	22500	25	7.50	25	7.50	25	7.50	75	22.50
7.	Hybrid Watermelon	30000	22500	5	1.50	5	1.50	0	0	10	3.00
8.	Tip 6 persons / year @ Rs.96000/ year for five years	96000									28.80
9.	Publicity Advertisement and Transport										7.00
10.	Exposure Tour & Training @ Rs.2500/ person for 200 farmers	2500									5.00
11.	Traveling Allowances										3.00
	Total			195	58.50	215	64.50	205	61.50	615	236.30

ADDITIONAL AREA BROUGHT UNDER MANIMUTHAR BASIN, P RODUCTION & PRODUCTIVITY

S.No	Name of the Crop	Additional Area in Ha	Production in tons	Productivity
1.	Fruit Plants			
	1. Mango	25	150	6
	2. Sapota	20	600	30
	3. Aonla	120	2160	18
2.	Vegetables Crops			
	1. Hybrid Bhendi	215	2150	10
	2. Water melon	10	100	10
	3. Hybrid Chillies	150	150	1
	4. Hybrid Brinjal	75	1125	15

REQUIREMENT OF PLANTS AND HYBRID VEGETABLE SEEDS

S.No	Name of the Crop	Area	Quantity in no's / kg
1.	Fruit Plants		
	1. Mango	25	2500
	2. Sapota	20	3200
	3. Aonla	120	33000
2.	Vegetables Crops		
	1. Hybrid Bhendi	215	537.500
	2. Water melon	10	25.00
	3. Hybrid Chillies	150	37.500
	4. Hybrid Brinjal	75	375.00



FISHERIES DEPARTMENT

***WORLD BANK ASSISTED
MULTI DISCIPLINARY PROJECTS***



IAMWARM

MANIMUTHAR SUB BASIN

SIVAGANGAI DISTRICT

AND

RAMANATHAPURAM DISTRICT

FISHERIES PROPOSALS

Sivagangai District is one of the dry districts of Tamilnadu. To cope up with the situation, our ancestors have constructed a number of non-system irrigation tanks and village ponds wherever possible to conserve the water resources for judicious usage. The District mainly receives water during North-East monsoon only i.e. between October and December every year. The District has following water storage resources: -

Sl.No.	Type of water storage resources	No.	Area at FTL (in ha.)
1.	Major irrigation tanks	603	48734
2.	Minor irrigation tanks	2443	24266
3.	Panchayat tanks	740	4318
4.	Municipality tanks	10	20
5.	HR&CE tanks	17	15
6.	Private tanks	170	342
	Total	3983	77695

These water sources can be used for fishery development to augment fish production. The tanks are seasonal and many of them have water retention period of less than five months only. Based on the quantum of water receipt and the consumption assessment, the tanks suitable for fish culture are to be identified. In other cases, the fishery can be developed only during the years of excess rainfall. For example, last year (2005-06) was a good year for culture fishery in the District. But the same trend can not be expected every year in this District. More over many of the system and non-system tanks of the District require renovation works for better retention of water. Therefore, under World Bank assisted Multi Disciplinary Project, IAMWARM, the PWD of Sivagangai District has proposed various tank renovations works such as desilting, bund strengthening, sluice repairs etc..etc.. This effective reconstruction will facilitate better water conservancy and therefore water retention period may also increase. In such cases, the opportunity for culture fishery will also increase.

The Fisheries Department has a vital role in the extension of technologies on scientific fish culture, fish seed production and distribution. However, the Government intervention in promotion of extension of inland fish production technologies in Sivagangai and Ramanathapuram Districts is very much nominal due to poor retention of water in irrigation sources at present. On execution of renovation works by PWD under IAMWARM project, the water retention period and actual water spread area will increase and pave way for inland fishery development. Extension of Inland Fishery Technologies has to be a continuous process

since the stakeholders are frequently changing owing to the non -existence of permanent fishery rights in majority of these water bodies.

The Government have proposed the World Bank assisted Multi -Disciplinary project namely IAMWARM for implementation in Manimuthar sub basin through Public Works Department involving the line departments with their respective programmes. This river basin covers Karaikudi, Thirupathur, Devakottai Taluks in Sivagangai District and Thiruvadana Taluk in Ramanathapuram District. The implementation of this special scheme on development of Fisheries in the basin areas, which remain underutilized at present is indeed a boon for boosting fish production, creation of rural employment opportunities and improving the socio - economic status of inland fisherfolk.

PROPOSAL NO.1: ESTABLISHMENT OF FISH SEED BANK

In Sivagangai and Ramanathapuram Districts, fish seed farm is available neither in Government sector nor in Private sector though the water storage sources are many. The demand for fish seeds in these Districts is met from the adjacent Districts like Madurai and Thanjavur. If a private fish seed farm is established in Manimuthar sub basin, it will be a boon to the fish farmers of these Districts. Fish seed production, rearing and trade demand timely action and immediate decisions with financial flexibilities. It has been observed that private fish seed traders are capable of importing fish seeds immediately from States like West Bengal and Andhra in times of necessity. Therefore, it is proposed to establish a private fish seed farm at a suitable area within Manimuthar sub basin under IAMWARM Project.

The fish seed farm may be constructed on the land of a progressive farmer or the land of Water Users' Association. The cost of construction shall be borne by the Government under IAMWARM project and the beneficiary shall be imposed a condition of running the fish seed farm for a minimum of five years at his cost.

Due to the prevailing dry conditions of these Districts till September every year, the fish seed farm shall have one rearing cycle only from June to September. The farm will then go for direct procurement and sale of fingerlings from Andhra and West Bengal to meet the sudden spurt in fingerlings demand owing to North East monsoon rains.

COST AND RETURN ANALYSIS

FISH SEED BANK

MODEL:

- | | | |
|---------------------------|---|---------------------|
| 1. Fish seed rearing area | - | 500 sq.m. |
| 2. Stocking material | - | Early fry of carps. |
| 3. Harvest material | - | Fingerlings |
| 4. Rearing period | - | 30 - 45 days |
| 5. Survival rate | - | 20 % |
| 6. Stocking density | - | 6 million / ha. |

A. FIXED COST (Rs.)

1. Land	-	Beneficiary's
2. Cost of construction of nurseries including water supply provisions	-	10.00 lakhs
3. Nets, Velon Screen and other Accessories	-	0.50 lakhs

Total		10.50 lakhs

B. OPERATIONAL COST (Rs.)

1. Cost of Early fry @ Rs.1000 / lakh	-	0.030 lakhs
2. Cost of feed	-	0.075 lakhs
3. Cost of manure, lime etc.,	-	0.010 lakhs
4. Cost of electricity	-	0.100 lakhs
5. Other contingencies	-	0.020 lakhs

Total (for one cycle)	-	0.235 lakhs

C. DIRECT TRADE OF FISH SEEDS USING FARM F OR TEMPORARY STORAGE

1. Purchase cost of 30 lakhs fingerlings (@ Rs.250 / 1000 fingerlings) from Andhra or West Bengal	-	7.50 lakhs
2. Sale value of 27 lakhs of fingerlings (@ Rs.350 / 1000 fingerlings) (10% mortality during transit)	-	9.45 lakhs

D. LABOUR COST

1. Cost of labour for 7 months (Rs.1500 X 4 X 7)	-	0.42 lakhs
2. Cost of security for 12 months (Rs.1000 X 1 X 12)	-	0.12 lakhs

E. RETURNS (Rs.)

1. Sale of farm reared fingerlings (@ Rs.400 / 1000 fingerlings)	-	1.20 lakhs
2. Sale of imported fingerlings (@ Rs.350 / 1000 fingerlings)	-	9.45 lakhs

Total	-	10.65 lakhs

D. NET RETURNS (Rs.)

1. Gross return	-	10.65 lakhs
2. Expenditure		
a. Operational cost	-	0.235 lakhs
b. Labour cost	-	0.540 lakhs
c. Purchase cost of fingerlings	-	7.500 lakhs

Total		8.275 lakhs

3. Net Returns (Rs.)	-	2.375 lakhs

Under IAMWARM Project, the beneficiary shall be endowed with a fish seed farm @ Rs.10.50 lakhs at his land. The land cost and all other expenditure will be borne by the beneficiary fish seed farmer. By this establishment of private fish seed farm, 28.2 lakhs fingerlings can be sold out in Sivagangai District and Ramanathapuram Districts which is likely to produce 70 tons of fish worth of Rs.21 lakhs every year.

PROPOSAL NO.2: PROMOTION OF FISH CULTURE IN IRRIGATION TANKS OF MANIMUTHAR SUB BASIN BY PROVISION OF CAGES.

Due to high rate of return and less risks when compared to Agriculture and Animal Husbandry, the fish culture in fresh water has gained momentum and the people from various walks of life have started venturing into culture fisheries recently. However, the utilization is not proportionate to the available resources and the production is not up to the potential, owing to lack of ownership of fishery rights and several other factors. Generally, these Districts receive rainfall in October – December every year and those tanks which received adequate waters are leased by the owners of fishery rights, i.e., mostly Local Bodies and Revenue Department from January onwards. By the time the leasing is finalized, the lessee could not procure fish seeds or the water retention period left over is very meagre. It is estimated that only a little fraction of the resources are effectively utilized for fish culture and in other waters, capture fishery system is in vogue.

In order to motivate the rural public to take up fish culture in the locally available water resources as a source of self employment and to boost up inland fish production to make available the protein rich food to the rural folk at their doorstep, the fishery rights of potential water pieces shall be vested with the beneficiary for a continuous period of five years along with extension of fish culture technologies to them.

Under the IAMWARM Project in Manimuthar sub basin, it is proposed to activate fish culture in irrigation tanks of Thirupathur, Karaikudi and Devakottai Taluks of Sivagangai District and Thiruvadanai Taluk in Ramanathapuram District.

In Manimuthar Sub basin, hundreds of system and non-system tanks are available and the PWD has proposed repair works in many of them. The tanks suitable for fish culture during the year will be identified based on water receipt, expected water retention period, water conservancy practices etc., etc., The beneficiaries of fishery rights in these tanks will be provided with suitable fish seed rearing cages for rearing late fry into fingerlings / fingerlings into advanced

fingerlings till such time, these tanks receive water during North East monsoon. On receipt of adequate water in the tanks, the fingerlings / advanced fingerlings will be released into it. This type of cage culture will partially offset the low water retention period in the irrigation tanks. To develop fish seed rearing in cages, the tanks shall have the dead storage below sill level to facilitate collection and retention of water from sporadic rain in South West monsoon.

A cage is a rectangular box type synthetic net with all sides covered and with the provision of opening at top to facilitate feeding and harvesting of fish seeds. The standard size of the cage is 10 X 4 X 1m .

The cages are cost effective, portable and easily maintainable. The cages can be made to float or fix in the water bodies where the water depth is at a minimum of 4'.

Types of cages and their usage are

P40 - To rear early fry to late fry

P16 - To rear late fry to fingerlings

P8 - To rear fingerlings to advanced fingerlings / to retain fingerlings with Stunted growth.

The extended retention / raising to advanced fingerlings in the cement cisterns will involve huge expenditure on land, construction of rearing ponds, management and maintenance. As an alternative, if the further rearing of seeds is carried out in cages erected in irrigation tanks or village ponds wherever possible it will greatly minimize the expenditure and reduce the cost of transport of seeds and will overcome the mismatch between fish seed season and fish seed stocking season.

Though the culture can very well be taken up by stocking fingerlings (4 -5cm) in irrigation tanks, if the seeds are further reared and raised up to 7 -10cm in cages and stocked , the fish production can be maintained as stunted, the growth will boost up on arrival of the favorable environment.

To facilitate the transfer of this technology to the fish farmers, we have suggested maintenance of dead storage in irrigation tanks as a multi utility measure. If 5 -10% of the total water spread area of the irrigation tanks are excavated to a depth of 2m, the water from occasional SW monsoon rainfall can be stored in the irrigation tanks itself in the month of June - July. This water retention will facilitate rearing of fish seeds in cages. The erection, stocking of seeds and maintenance of cages will be carried out by the beneficiaries. By this programme part / whole of the seed requirement (depending upon the water spread area of the irrigation tanks) can be met on the spot by the fish culturists themselves. The Cost and Return analysis is as follows:

COST AND RETURN ANALYSIS

ASSUMPTION

1.	CAGES (HDPE)		
	a. P 40 (10 X 4 X 1m)	-	1
	b. P 16 (10 X 4 X 1m)	-	1
	c. P 8 (10 X 4 X 1m)	-	1
2.	Early Fry stocked in cage	-	1.0 lakh
3.	Feed (powdered R.B. + GOC)	-	300 kg.
4.	Survival rate		
	a. Early fry to late fry	-	50%
	b. Late fry to fingerlings	-	70%
	c. Fingerlings to advanced fingerlings	-	60%
5.	Number of advanced fingerlings expected in a rearing cycle	-	21000
6.	Days of rearing	-	40-45 days
7.	Number of rearing cycles in one year	-	1
A.	Fixed Cost (Rs.)		
	a. Cages (HDPE) 3 Nos.	-	12000
	b. Cost of allied materials like casuarina poles wires, buckets etc.	-	3000
	Total		----- 15000 -----
B.	Operational Cost (Rs.)		
	a. Cost of Early fry	-	1000
	b. Cost of transportation & incidental charges	-	1000
	c. Cost of feed	-	2200
	Total		----- 4200 -----
C.	Returns (Rs.)		
	a. Value of fingerlings	-	8400
D.	Gross Profit (Rs.)	-	4200
E.	Net Profit (Rs.)		
	a. Depreciation on FC 20% in gross profit	-	400
	b. Net profit (Rs.)	-	3800

The fish seed rearing cages and accessories shall be supplied to the beneficiaries on 100 % subsidy basis once. The cost of seeds, transportation and feed shall be reimbursed 100% for one time rearing only. For subsequent rearing the beneficiaries should continue the operation by themselves.

To enable seed rearing in irrigation tanks, the PWD. shall make arrangements to maintain minimum water level (6') in the irrigation tanks. At present, there is no authorized provision for retention of water below sill level of the vents of irrigation tanks and naturally there is no chance of retention of water when the tank is drained. Maintenance of dead storage is a multi

utility provision and hence it is absolutely essential. It is suggested that about 5 -10% of the total water spread area of the irrigation tanks located in the sub basin area should be deepened as a PWD component to depth of 2m below the sill level to ensure retention of water at the time of initial filling / occasional rainfall.

To enable the fishery beneficiaries to undertake cage culture, free supply of 300 cages is proposed. 21 lakhs of fingerlings / stunted fingerlings can be raised for stocking the same irrigation tanks. The estimated cost of purchase of these cages and accessories will be Rs.15.00 Lakhs @ Rs.5000 / cage. In addition, an operational cost of Rs.4200/- per one rearing cycle is expected and the cost will be Rs.4.20 lakhs per cycle. A total expenditure of Rs.19.20 lakhs is proposed for fish seed rearing in cages. The works on erection, management and maintenance of the cages including feeding will be carried out by the tank fishery beneficiaries by engaging fishermen labour at their cost.

PROPOSAL NO 3: AQUACULTURE IN FARM PONDS

In dry Districts like Sivagangai and Ramanathapuram, the agriculture faces risk in case of non-availability of irrigated water at the fag end of culture of crops like paddy. To mitigate the problem, the farmers are advised to save surface water in their own farm land for use in case of water inadequacy from irrigation sources. The advantages of farm ponds are realized by the farmers during the harvest season. The farm ponds are normally constructed in lands where there is a deficit from irrigation water sources. In case of adequacy of water supply from irrigation sources, these farm ponds facilitate ground water recharge, drinking water for cattle, etc. This farm pond can also be used for fish culture in case it retains water for more than five months but below 10 months to supplement earnings of the farmer .

In Sivagangai and Ramanathapuram Districts, the farm ponds are likely to retain water for 3 to 4 months only i.e. from October to January if the water is pumped to complete agriculture. To make fish production within the system, it is advisable to stock advanced fingerlings of about 50g. each so that the fish will grow to a marketable size within four months. The cost and return analysis of aquaculture in farm pond is as follows:

ASSUMPTIONS:

DoC 120 – 150 days

- | | | | |
|----|---|---|-----------|
| 1. | WSA of farm pond | - | 0.1 ha |
| 2. | Depth of water | - | 2.0 m. |
| 3. | Lime | - | 50 Kg. |
| 4. | Manure: | | |
| | a)Organic | - | 750 Kg. |
| | b)Inorganic | - | 50 Kg. |
| 5. | Fish seeds (stock size>50 g)
(Catla 500, Rohu 200, Mrigal – 100,
Common Carp – 200) | - | 1000 Nos. |
| 6. | Feed | | |
| | a)Rice bran 600 Kg | | |
| | b)Groundnut oil cake – 300 Kg | - | 900 Kg. |
| 7. | Average fish growth | - | 750 g. |
| 8. | Percentage of recovery | - | 80% |
| 9. | Expected fish production | - | 600 Kg. |

COST AND RETURN ANALYSIS

A. Fixed Cost (Rs.)

a. Pond (excavated by AED)	- NIL
b. Cost of velon screen, happa, buckets, feed trays etc.	- 2000

Total	- 2000

B. Operational cost (Rs.)

a. Lime	- 250
b. Manure	- 750
c. Stock size fish seed (>50g)@3/-per seed)	- 3000
d. Feed (Rs.3.50 per Kg of RB 600 Kg, Rs.15/- per Kg of GOC 300 Kg)	- 6600
e. Harvesting and Miscellaneous	- 1500

Total	12100

C. Returns (Rs.)

By sale of 600 Kg fish @ Rs.30/-per Kg	- 18000
Gross Profit (C-B)	- 5900

D. Net Returns (Rs.)

After allowing 20% (Rs.400) depreciation of FC	- 5500
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The Agricultural Engineering Department (AED) has proposed excavation of 50 farm ponds in Manimuthar Sub basin under IAMWARM. Besides, the AED of Sivagangai District has excavated about 40 farm ponds in Karaikudi, Thirupathur and Deva kottai Taluks during 2004-06 under RSVY Scheme. The Sub basin area of Ramanathapuram District is also likely to have about 10 farm ponds. Therefore about 100 farm ponds are likely to be in this sub basin. All the farm ponds may not receive adequate water every year to enable fish culture, since these farm ponds are located in the tail ends of irrigation sources. An assumption of 50% of them to receive adequate water is likely to be a reality. Therefore it is proposed to implement aquaculture in 50 farm ponds only. The fish culture cost of Rs.0.141 lakh per farm pond shall be borne under IAMWARM project on 100% subsidy basis for the first year only. Beyond that, the farmer should himself undertake fish culture. Therefore the expenditure under this project will be Rs.7.05 lakhs only.

PROPOSAL NO.4: SUPPLY OF FISHING IMPLEMENTS TO FISHERMEN.

These subsistence fishermen are using their old nets for fishing operations resulting poor catches due to poor fishing efficiency of the fishing gears. In order to increase the catching efficiency and to improve the livelihood of fishermen depending upon the Manimuthar sub basin, it is proposed to supply new synthetic nets at free of cost (100% subsidy) to them.

The project proposal includes development of fisheries in suitable irrigation tanks aiming about 200 tons of fish production per annum. To harvest the fishery, the members of Inland Fishermen Co-operative Societies are required to be engaged. In this project area, Thirupathur, Karaikudi, Kunrakudi Inland Fishermen Co-operative Societies (FCS) with members, engaged in fishing activities are functioning. As a socio-economic measure, the FCS members may be supplied with drag nets and accessories on 100% subsidy basis at Rs.20,000/- per net / group of 5 fishermen each. Since irrigation tank fish harvest is a group based activity, suitable drag nets will be supplied to the fishing groups as one time benefit.

The estimated cost under this component is as follows:

Description	Cost (Rs. in lakhs)
Cost of 50 drag nets (synthetic)with head rope, foot rope, floats and sinkers to the members of Inland Fisherman Co-operative Societies @ Rs.20,000/- net for 50 groups(each group consisting of 5 fishermen)	10.00 -----
Total	10.00 -----

MARKETING OF ADDITIONAL FISH PRODUCE

At present, whole sale market facilities for fish disposal are available at Thirupathur and Sivagangai in private sector in Sivagangai District. The demand for inland fish in Ramanathapuram District is low since marine fishes are available in plenty throughout the year. However bulk of fish produced reaches Madurai and Thanjavur markets in hired vehicles for disposal and distribution to inter-State centers like Calcutta, Palakadu and Trivandrum . Till attitudinal changes among the public regarding consumption of cold stored inland fishes happen, this trend will not change and availability of inland fishes in the market will be a seasonal one. The expected additional production of inland fish due to the implementation of IAMWARM project in Manimuthar Sub basin can be disposed in major whole sale markets of Madurai.and Thanjavur. Hence, no difficulty in marketing is expected in the disposal of additional produce by the IAMWARM project.

ABSTRACT OF PROJECT PROPOSALS

PROPOSAL	AMOUNT (Rs. in lakhs)	
1. Fish seed bank	10.50	
2. Fish seed rearing in cages	19.20	
3. Aquaculture in farm ponds	7.05	
4. Supply of fishing implements	10.00	
Grand Total	46.75 (or)	47.00 Lakhs

CIVIL WORKS TO BE CARRIED OUT BY PWD UNDER THEIR PROJECT TO IMPROVE PROJECT FISHERY

1. Formation and Maintenance of dead storage PWD (WRO) irrigation tanks

The irrigation tanks are located sporadically in various places, adjoining a number of villages. Water is a curse in case of flood and water is a blessing in case of drought. Water management is an essential prerequisite for any civilized society. Maintaining dead storage in irrigation tank, as a measure of water management will benefit the villagers, yielding multi utilities.

1. Water availability in dead storage after completion of irrigation will benefit cattle.
2. Ground water recharging is continued.
3. Water is usable for bathing.
4. The cultured fishes can be harvested easily in prime condition.
5. Fish mortality due to high temperature / sudden drain of water can be averted.
6. Fish seed rearing can be done in irrigation tanks itself.

Therefore all the WRO irrigation tanks under the project shall be provided with a dead storage, extending to 5-10% of the total WSA with a depth of 2m. This level shall be maintained / restored by incorporating annual / periodic maintenance. Otherwise silting up will reduce the water storage level.

2. Provision of protective wire mesh to prevent migration of stocked fish from the irrigation tanks.

Fish has high mobility and hence the water flow triggers the fish to migrate from one waterbody into another, causing financial loss to the fish farmers concerned. Provision of a protective wire mesh in inlet and outlet without hindering water flow will enable the culture fishes to remain within the tank. The fishery beneficiary of the tank shall be entrusted with the job of removal of any clogging at his cost.